

JPRS-UEA-86-011

8 APRIL 1986

# USSR Report

## ECONOMIC AFFAIRS

EKO: ECONOMICS AND ORGANIZATION OF  
INDUSTRIAL PRODUCTION

No 11, NOVEMBER 1985



FOREIGN BROADCAST INFORMATION SERVICE

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USSR REPORT  
ECONOMIC AFFAIRS

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OF INDUSTRIAL PRODUCTION

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Except where indicated otherwise in the table of contents the following is a complete translation of the Russian-language monthly journal EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA published in Novosibirsk.

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PUBLICATION DATA

English title : EKO: ECONOMICS AND ORGANIZATION  
OF INDUSTRIAL PRODUCTION No 11,  
Nov 1985

Russian title : EKO: EKONOMIKA I ORGANIZATSIYA  
PROMYSHLENNOGO PROIZVODSTVA

Author(s) :

Editor(s) : A. G. Aganbegyan

Publishing House : Izdatel'stvo "Nauka"

Place of Publication : Novosibirsk

Date of Publication : November 1985

Signed to press : 24 September 1985

Copies : 142,748

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i organizatsiya promyshlennogo  
proizvodstva", 1985

## EDITOR OUTLINES ECONOMIC POLICY

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 3-31

[Article by Academician A. G. Aganbegyan: "The General Course of the Economic Policy"]

[Text] An important stage on the path to setting goals and determining the paths of our development was the conference of the CPSU Central Committee which was held in June of this year to discuss questions of accelerating scientific and technical progress. Actually this was the country's party and economic aktiv. A comprehensive analysis of the state of affairs was presented in the report titled "The Radical Issue of the Party's Economic Policy" given by General Secretary of the CPSU Central Committee Comrade M. S. Gorbachev. Twenty-eight people participated in the discussion of the report. From the results of the conference the Politburo of the CPSU Central Committee adopted a special decision, envisioning in it measures for implementing the proposals made in the report and in the speeches.

The conference was an important landmark in the preparation for the 27th CPSU Congress. It was noted there that problems of accelerating and technical progress should be at the center of the preconference report and election campaign and all of the party's political, organizational and educational work. The attention of all the people should be fixed on this.

The concept of acceleration of the country's socioeconomic development which was put forth by the April (1985) Plenum of the party Central Committee was developed and concretized at the July conference of the CPSU Central Committee. The rates of annual increase in national income are to grow from approximately 3 percent at the present time to a minimum of 4 percent even in the next few years. Subsequently our economic growth is to accelerate even more. But the matter cannot be reduced to increasing rates. The relationship between extensive and intensive factors in economic growth must change radically.

### In Circumstances of Reducing Resources

As we know, beginning with the 9th Five-Year Plan in our country there has been a reduction of the increase of production resources. Under the 11th

Five-Year Plan the increase of resources decreased by approximately one-third as compared to the 10th Five-Year Plan. Under the 12th and subsequent five-year plans as a result of a number of objective factors, it is expected that there will be further development of this tendency: because of the demographic consequences of the war the number of people employed in material production under the 11th Five-Year Plan will increase by 2 percent (under the 10th it increased by 4 percent) and under the 12th and subsequent five-year plans the number of workers will stabilize. For the first time we will have to achieve the entire increase in public production as a result of increasing labor productivity. In many branches and regions labor productivity should increase by even greater amounts than the volume of production increases.

At the same time there has been a sharp reduction of the increase in capital investments in the national economy: under the 10th Five-Year Plan they increased by 32 percent, and under the 11th they are expected to increase by 16 percent. An important reason for this is the reduction of the proportion of the accumulation fund in the national income as a result of its redistribution in favor of the consumption fund so as to accelerate the improvement of the public well-being. In subsequent years even if we manage to increase the growth rates of capital investments it will apparently not be by very much.

The dynamics of fixed production capital depend on capital investments. Under the 10th Five-Year Plan they increased by 43 percent and under the 11th they will increase by more than 30 percent. But in the subsequent period, because of the fact that the increase in capital investments under the 11th Five-Year Plan will be reduced by half, these funds will increase by much smaller amounts.

Because of the deterioration of the mining-geological and economic conditions for the extraction of fuel and raw material, their increased production cost and especially capital-intensiveness, the prolongation of the time periods for assimilation of the new fuel and raw material base in the eastern and northern regions of the country, the growth of the extraction industry has slowed down. Under the 11th Five-Year Plan the volume of extraction of fuel and raw material is increasing by approximately 7 percent as compared to 10 percent under the 10th Five-Year Plan and 25 percent under the 9th Five-Year Plan. The extraction of coal in the USSR has not increased since 1978, the extraction of petroleum (including gas condensate) has not increased since 1983, the volume of timber procurements has decreased significantly since 1975, and the extraction of commercial iron and manganese ore has not increased since 1978. One must say that this is a worldwide tendency toward reduction of the extraction of fuel and raw material and it will continue during the next few 5-year periods.

If one tries to generalize all that has been said and reduce the various indicators of the dynamics of resources to a single measure, relying on the labor invested in them, then according to estimates the integral indicator of the increase of all kinds of resources under the 10th Five-Year Plan was approximately 13 percent, under the 11th it dropped to 10 percent, and under subsequent five-year plans it will be 7 percent and less.

Such is the reality. But with this kind of development of extensive factors in economic growth we cannot rely on them when solving the problem of accelerating the country's socioeconomic development. It is no accident that in the materials of the July Conference of the CPSU Central Committee it is emphasized that now the "expenditure" path of development of the economy will doom the country to stagnation.

And so it is necessary to decisively switch the national economy over to the path of intensive development as a result of better utilization of resources. How the situation here took form under the 10th and 11th five-year plans and the possible variants of future development are shown in the following table.

<u>Indicators</u>	<u>10th Five-Year Plan</u>	Increase Over 5-Year Period, Percentages		
		<u>11th Five-Year Plan</u> (Expected Fulfillment)	<u>Five-Year Plan</u> With Annual 4% Growth of National Income	<u>Five-Year Plan</u> With Annual 5% Growth of National Income
National income used for accumulation and consumption	21	18	22	28
Production resources	13	10	7	7
Effectiveness of public production	7	7	14	19
Proportion of intensive factors in growth of national income	1/3	2/5	2/3	3/4

As we can see, in order to accelerate the growth rates of the national income from 3 to 4 percent per year, it is necessary to double the dynamic of the effectiveness of public production, providing for an increase in it from 7 to 14 percent during the 5 years. Such an increase in the effectiveness of public production can be achieved if we accelerate the increase in labor productivity 1.5-fold, reduce the material-intensiveness of products at twice as rapid a rate and basically stabilize the output-capital ratio in the national economy (so far it is being reduced by 13-14 percent per 5-year period).

Under the past three five-year plans--the 9th, 10th and 11th--in spite of measures that have been taken, the effectiveness of the national economy has increased by approximately 7 percent during each 5-year period. The economy has continued to develop out of inertia, mainly on an extensive basis. The reasons for this situation were revealed quite definitely at the April Plenum of the party Central Committee and at the conference of the CPSU Central Committee. The main reason was that we have not properly taken into account the radical changes in the economic situation or exhibited the necessary persistence in changing the structural policy, forms and methods of management and the very psychology of management activity. Much has been said about shifting the center of gravity to intensive factors in economic growth, but the measures that have been taken have been half-measures, inconsistent ones



which have not been seen through to the end. Under the new conditions it will be necessary in a short period of time to do everything we have been unable to do in the past--overcome the negative tendencies in economic development, make our immense economy take a sharp turn toward intensification and achieve a considerable acceleration of the country's socioeconomic development.

But how can this be done?

At the conference of the CPSU Central Committee they substantiated an entire system of large-scale national economic measures directed toward accelerating the country's socioeconomic development. With a certain amount of conventionality these measures can be grouped into two areas. First, these are measures for mobilizing the organizational-economic and social reserves and possibilities that are associated with better utilization of available resources and the existing production apparatus. The effect from these measures, as a rule, does not require large capital investments and can be obtained in a short period of time. But these reserves and possibilities are limited and, as it were, lie close to the surface. The more significant and deeper possibilities are associated with scientific and technical progress. This is what acts as the major strategic lever in accelerating the country's socioeconomic development.

Drawing in both groups of resources depends decisively on the creation of new economic and organizational conditions during the course of a profound restructuring of the system of planning and management and the entire economic mechanism. In EKO we have repeatedly discussed the mobilization of organizational-economic and social factors in the development of the national economy and, above all, the utilization of the human factor.<sup>1</sup> Now, in light of the tasks set forth at the conference of the CPSU Central Committee, we should like to concentrate on problems of accelerating scientific and technical development.

#### Revolutionary Changes in Scientific and Technical Progress

The tasks facing the country are so large that they cannot be resolved by continuing to carry out scientific and technical progress mainly by the evolutionary path. The evolutionary path presupposes improvement of existing technical equipment and technology. It includes, for example, increasing the capacities of tractors without radically changing agrotechnology and the entire technical system of agriculture; it means increasing the capacities of installations while retaining the old technology, increasing the speed of cutting as a result of increasing the productivity of machine tools but while retaining the previous methods of metal processing; it means simple enlargement of reinforced concrete structures for construction, and so forth. This provides for a certain increase in labor productivity for the basic workers and in a number of cases the material intensiveness is reduced somewhat.

But since the production process as a whole is not technically transformed with this approach the number of auxiliary and service workers, as a rule, does not decrease. Associated with this is the result which is paradoxical at first glance when with a significant increase in labor productivity the number



of workers employed in manual labor not only has not decreased, but has even increased. Moreover the increase in capacities and other areas of technical improvement of existing technical equipment and technology involve additional capital investments and each subsequent improvement requires more and more money. Therefore the evolutionary path of scientific and technical progress is usually accompanied by an increase in the capital-intensiveness of production.

The evolutionary form of scientific and technical progress described above has prevailed in the national economy until recently. Largely because of this the effectiveness of public production has been increasing slowly--less than 1.5 percent per year. This integrated indicator is formed from the increase in labor productivity in the national economy by approximately 3 percent per year in the savings on fuel and raw material of approximately 2 percent per year. But the effect achieved here is devalued by the fact that at the same time the capital-intensiveness of public production has been increasing by 3 percent per year.

Since we must break the existing tendency and achieve a radical qualitative improvement in the development of productive forces we cannot continue to rely on the evolutionary form of scientific and technical progress as a basis for this. It cannot provide for a radical increase in national economic effectiveness. A radical increase is provided only by revolutionary changes in scientific and technical progress, when there is a changeover from old to new generations of technical equipment, from existing technological systems to principally new ones. Only then will labor productivity and other indicators of effectiveness improve not by percentage points as with the evolutionary path, but geometrically.

Let us illustrate what we have said with individual examples. Because of inertia recently we constructed an electric steel-smelting shop at the Kuznetsk Metallurgical Plant using old technology. Here the entire process of manufacturing steel takes place in an electric furnace and therefore takes a good deal of time. From one 100-ton electric furnace one should obtain about 200,000 tons of steel a year. But there is a technology which is radically different from the old one. In this case the electric furnace is used only for smelting the metal and it is brought up to the necessary condition by the method of ladle metallurgy. To do this it is necessary to have a special bucket, installations for vacuuming steel, installations for processing synthetic slags and so forth. This way one provides not only for high quality of the metal, but also the yield of steel from one 100-ton furnace increases to 400,000-500,000 tons, that is, 2-2.5-fold. But to do this it is necessary to transform the entire technology: it is necessary to have a different design of the building, a more powerful transformer, more powerful devices for loading, gas purification and so forth. But labor productivity increases sharply, electric energy is saved and the output-capital ratio increases significantly with a simultaneous improvement in product quality.

Another example involves the extraction of coal. By filling the coal mine with technical equipment while retaining the traditional technology we do not achieve an increase in labor productivity. As we know, at mines of the country, even if we give a rebate for deterioration of mining and geological

conditions, it decreases from year to year. This is related primarily to the lack of comprehensiveness of the technical development of the mines and the retention of the old technological system for working them. But if we applied principally new technological systems it is possible to achieve an increase in labor productivity of the mines of 2-3-4-fold and more. With respect to the extraction of coal at the mine by the "dry" method, no complete new technology is being introduced, although at one time there were plans for creating on new principles the so-called "mines of the future" which provide for increasing labor productivity many times over. But this work has died out.

A revolutionary new technology involves hydraulic extraction. There was a time when the development of hydraulic extraction was carried out under the direct leadership of the VNIIGidrougol Institute (Novokuznetsk) which had its own experimental plant and capabilities of comprehensive introduction of the new technology. That was when phenomenal results were achieved. Thus the average monthly productivity of the mine Baydayevskaya No 2 ("Severnaya") reached 283 tons, which is 3 times as much as at other mines which were operating with similar mining and geological conditions. The level of productivity was also 2.5-3 times higher at hydraulic mines that were operating with thin and steep-sloping beds. Moreover the construction of the hydraulic mines in terms of the comparable capacity cost 30 percent less, the expenditure of metal and timber materials was several times less, and the conditions for labor and safety technology improved significantly.

There is one more example, from the area of thermal energy engineering. The capacities of electric power stations can be increased in two ways: according to the old system, by increasing the sizes of the boiler aggregates and also changing over to principally new kinds of current. The central boiler and turbine institute in its development has taken the second path and suggested a design for a small vortex furnace. The boilers designed by the TsNIPKI went through fairly complete testing at electric power stations of the USSR: the Rastovskaya TETs, the Novosibirskaya TETs, the Nazarovskaya GRES (using Kansk-Achinsk coal) and others, and it proved to be reliable and effective. The manufacture of these boilers requires 25 percent less metal, the sizes of the buildings are reduced sharply, the volume of construction and installation work decreases, and the time period for construction are cut in half because of the smaller volumes, the simplicity of the design of the buildings and also because of the possibility of delivering a small boiler that it is installed in blocks. At the same time there is a reduction of the expenditure of fuel and, because of more complete combustion, harmful discharges into the atmosphere are reduced. But the boiler construction plants, mainly the one in Taganrog, because of their greed for "growth output" which depends on the metal-intensiveness of the boiler, continue to produce the old sets of boilers. Following in their old rut, the boiler construction workers have brought this matter almost to the point of being absurd. For the Berezovskaya GRES-1 which is under construction and will use Kansk-Achinsk coal, they manufactured a boiler according to the old plans which was 117 meters high and weighed 26,000 tons, which was to have been mounted on a beam with a diameter of 6 meters! The height of the building was 132 meters.... Even if this boiler would have worked and produced the planned capacity, it would have been extremely difficult to service and repair. But the main thing is that this took an immense quantity of unnecessary material and volumes of construction.

And if they were to have used a small boiler with the same capacity (which was suggested), the height of the building could have been reduced by 50 meters, the output-capital ratio would have increased significantly, and the time periods for construction, which they have already failed to meet three times, would have been sharply reduced.

As one can see from these and many other examples, the revolutionary approach to scientific and technical progress provides not only for considerable growth of labor activity, but at the same time leads to a large reduction of the material-intensiveness and, as a rule, to increased output-capital ratio. As a result, one achieves a comprehensive national economic effect. For this is precisely such national economic effectiveness, toward economizing on all kinds of expenditures and live and embodied labor, that scientific and technical progress should be directed.

From the economic standpoint a technical innovation can be considered to be progressive only if it provides for increased national economic effectiveness. Here I do not mean the exceptions that are related to technical means for facilitating labor, increasing its safety and protecting the environment. In these cases one takes into account not only economic, but also social effectiveness. All other conditions being equal, if the technical innovations which bring about a savings on one kind of expenditure (for example, a reduction of the labor-intensiveness of the product) at the same time cancel out the savings by additional expenditure of embodied labor--increased capital-output ratio--this will be not progress, but regression. So the national economic evaluation of new technical equipment, in our opinion, should be mandatory.

Not all of the adopted directions for scientific and technical progress are actually highly effective as of today. Thus because of the task that was set for introducing robots into production many enterprises began to manufacture their own not very good robots at triple the price, twice the weight and one-fifth to one-tenth the reliability of the best models. One fairly large robot which performs operations of loading during stamping usually releases one worker, it works less reliably than a human being, and it requires large expenditures on service and repair. As research at a number of machine-building enterprises showed, the average cost of such a robot is 40,000 to 50,000 rubles, and in a year it releases at best 4,000 rubles' worth of wages, and frequently even less. It is clear that from the economic standpoint this robot is ruinous. It is another matter when comprehensively automated technology is introduced, where robots perform responsible operations of welding, soldering, and painting, and they perform these and other operations better than when performed by hand, and they also operate continuously on two to three shifts with great reliability. In this case the robots increase labor productivity while simultaneously improving product quality, and the savings achieved here significantly exceeds the possible increase in capital-output ratio.

I used the example of the robots not only because this is a fashionable technical problem, but mainly because this approach is extremely typical. More and more frequently one encounters cases of semiprimitive production of poor-quality robots at many plants which belong to more than 20 ministries



where they do not have the proper conditions or personnel for this. Instead of one large robot which replaces only one stamping machine operator, the same money could be used to manufacture several modern 5-ton loaders, each of which releases up to 10 loading personnel from heavy manual labor, and there are millions of them in the country. This means that the ministries have the funds to produce robots that are not effective enough, but for two five-year plans now they have not been able to find the resources--incidentally, they are not large--to complete the reconstruction of the Lvov Plant for automatic loaders--the only one in the country that produces these loaders.

In order actually to transform scientific and technical progress into the main lever for accelerating the country's socioeconomic development it is necessary to give preference to the revolutionary form of scientific and technical progress, directing it toward a decisive increase in national economic effectiveness. In a word, it is necessary actually to start a scientific and technical revolution in the country.

#### The Scientific and Technical Revolution--Peculiarities of Its Modern Stage

In order to master the scientific and technical revolution and place its achievements in the service of the socialist economy, it is necessary to know the laws of its development and its specific features in the modern stage. First and foremost one should note that the scientific and technical revolution is a complex socioeconomic phenomenon. It not only includes processes of integration of science and production whereby production increasingly becomes technological application of science, but it also requires a rearrangement of the structure of the national economy and the adherence to a particular investment policy. An organic part of the scientific and technical revolution is the revolution in education, in personnel training. New technical equipment and technology can be handled only by a new type of worker, not only in the area of general educational and professional training. Such a worker must be distinguished by a more responsible attitude toward labor and high organization and discipline, and he must be directed toward creativity and initiative. One more constituent part of the scientific and technical revolution is radical improvement of organization and management. New technical equipment and technology must have a new and higher organization of production and better management. The very process of management is under the strong influence of scientific and technical progress: here scientific methods and approaches are being applied more and more extensively, and management is being placed on a modern technical basis in the form of information technology which relies on modern computers, means of communication and organizational equipment.

From such a broad understanding of scientific and technical progress follows the need for a broad, comprehensive system of measures for accelerating it. It was this kind of comprehensive approach that pervaded the entire report given by Comrade M. S. Gorbachev on behalf of the Politburo of the CPSU Central Committee at the conference on questions of accelerating scientific and technical progress. It encompassed a broad range of current and long-range problems: economic, organizational, social, the development of culture and education, and the activity of the upper echelons of management and of each unit of the national economy.

The rates of scientific and technical development in the world have accelerated essentially in recent years. This is a manifestation of a new stage in the scientific and technical revolution. A typical feature of this stage, in our opinion, is the formation for each production of integrated technological-economic systems with high effectiveness which are based on the latest generations of technical equipment.<sup>2</sup> We are speaking about the fact that each specific production is gradually embracing comprehensive technology which pervades this production process from beginning to end, technically transforming not only its basic work, but also its auxiliary and service jobs. This process is realized by an interconnected chain of machines, equipment and instruments. Such an integrated technological system requires a different kind of organization of production and management, and this is why we call it a technological-economic system. Such systems have high effectiveness, they are capable of increasing labor productivity 3-5-fold and more, they reduce the energy-intensiveness and material-intensiveness of production to two-thirds and less, thus, as a rule, they increase output-capital ratio, and they radically improve product quality.

Examples of such revolutionary technological systems in addition to the ones mentioned above are converter production of steel with continuous smelting and regulated rolling--in ferrous metallurgy; rotary and rotary-conveyor lines--in mass production; industrial systems for cultivating crops--in agriculture; information technology which is taking form before our very eyes on the basis of electronic computers, flexible production systems--in machine building, new reduced-stage waste-free technologies--in the petrochemical and chemical industry, biotechnology and others. With all their diversity and specific features, these new revolutionary technologies are also distinguished by a number of features they have in common.

In the first place, most of them have few operations. Frequently the new technologies are formed on the basis of combining many operations into one. For example, to replace many operations for cutting in metal processing there are methods of plastic deformation of metal, for example, by rolling or pressing. In rotary lines they combine processes of transportation and processing of items. Because of new catalysts the number of stages in chemical technologies is being reduced. Having fewer operations usually leads to high intensiveness of the production processes and therefore in the same areas and in the same volumes with new technologies the output of products increases sharply. In a number of cases this is related to the utilization of higher temperatures and pressures. Having fewer operations also leads to increased reliability of the entire production process which in many cases requires decisive significance among the characteristics of effectiveness. For reliability is an indispensable condition for automation and for a sharp reduction of operational expenditures.

In the second place, the new technological systems are characterized by reduced waste or no waste at all. In addition to the great economic advantage, this prevents pollution of the environment and produces an appreciable social advantage. Under modern conditions in which the scale of production has become immense, this side of the matter becomes exceptionally important.



In the third place, modern production systems are characterized by a merging of new technology and microelectronics, as a result of which a new quality is formed and the systems become automated. An example of such a merging of new technology for metal processing and microelectronics were the processing centers, the flexible production modules created on the basis of these, and the entire sections and shops which were composed of these modules in the form of flexible automated productions. Another example is the automated rolling mill with regulated rolling, the very design for which takes into account the existence of feedback from the electronic computer which controls this process. Extensive introduction of microelectronics into modern production is a most important feature of the current stage of the scientific and technical revolution.

In the fourth place, an ever larger number of principally new technologies are based on fundamental achievements of science and on new scientific ideas about the microstructures of substance. These include radiation technologies, atomic energy, laser technology, biotechnology, especially such an area as genetic and cellular engineering, and so forth.

Naturally, we have not lifted all of the features of modern technological systems. But what has been said is obviously enough to be convinced of the need for a comprehensive approach to technical transformation of production--to the introduction of new technological systems of a higher level.

#### Integration of Science and Production

Scientific and technical progress finds its sources in science. Therefore one of the cardinal conditions for acceleration of scientific and technical progress is the development of the country's scientific potential.

The communist party and the Soviet state have always devoted a great deal of attention to the development of science. In the USSR there are about 1.5 million scientific workers or one-fourth of all the scientific workers in the world. The country spends a considerable proportion of its national income on the development of science. In the majority of developed countries of the world this indicator is considerably less.

The successes of Soviet scientists in various areas of knowledge are widely known. Suffice it to refer to atomic energy, the mastery of space, the achievements of Soviet mathematicians, physicists, chemists, microbiologists and other specialists. But today the task of sharply accelerating scientific and technical progress which faces the country places new demands on the development of science. Understanding the priority significance of fundamental research, it will be necessary to increase the role of academic institutes in creating theoretical foundations for principally new kinds of technical equipment and technology.

At the June Conference of the CPSU Central Committee they made a proposal concerning organization within the framework of the USSR Academy of Sciences of Comprehensive Interbranch Scientific and Technical Centers following the example of the Institute of Electric Welding imeni Ye. O. Paton. As we know,

this institute is a large scientific and technical complex which includes not only a large research collective, but also design bureaus, experimental productions and several enterprises. This makes it possible for the institute not only to conduct research and technical developments, but also to manufacture models and even the first series of new equipment and to introduce them at enterprises and organizations. The institute has agreements with hundreds of enterprises where it introduces new technological processes, mainly automated ones. It coordinates not only scientific research, but also all technical activity for the development of welding methods in the country. Following the example of the institute of electric welding we have in mind organizing similar scientific and technical centers for the large areas of scientific and technical progress.

Another important organizational area for the integration of science and production is the creation of a network of large scientific-production associations which, following the example of the Kriogenmash and Svetlana associations and the Nikolayev Association for Producing Lubrication Equipment, could become true outposts of scientific and technical progress.<sup>3</sup> In our opinion, it is necessary to create comprehensive scientific production associations which would be capable of developing and introducing integrated technological systems. To do this the associations must include research subdivisions, design and planning organizations, experimental and series production shops, personnel training centers, organizations for supervised installation and introduction, and so forth. These should be powerful organizations which are capable of comprehensively introducing new technological systems while reequipping entire productions.

Above I gave the example of the electric smelting production when the new technological system had not been introduced at the Kuznetsk Metallurgical Combine. Actually there was no one to introduce it. Now business in ferrous metallurgy is organized in such a way that one organization does the planning, but it is separated from research and from the design bureaus and from production. And this being the case it is forced to be oriented mainly toward series-produced equipment, mainly obsolete equipment. On the other hand, the producers of electric furnaces, for example, the Novosibirsk Sibeлектроterm Association does not have scientific research subdivisions and its design bureau is narrowly specialized only in designing electric furnaces and it is not responsible for the entire technological process of producing electric steel. Correspondingly this association produces only electric furnaces and the plant itself which needs them acts as a client in acquiring loading devices, buckets, cranes and so forth. In a word, nobody is responsible for the final result. Yet the proportion of electric steel in the smelting of metal in our country, as in many other countries, should increase considerably for modern technical progress requires higher quality of metal. Moreover in our country, mainly in Siberia, we have the least expensive electric energy and therefore the cost of electric steel will be less for us than it is for other countries.

In order to be at the level of the highest world achievements in this important area, and this is a realistic task, it would be possible, on the basis of the Novosibirsk Sibeлектроterm Association, to create a large scientific production complex directed toward the introduction of new

technologies into electrothermal processes, mainly in electric steel smelting. In this case the association would have to design for itself the entire technology, offer the entire set of equipment both that which it manufactured itself and that which was manufactured in cooperation with other enterprises, and supervise installation and be responsible for the final result. But to do this it will be necessary to have as part of this association scientific research subdivisions and a planning section, to arrange production not only of electric furnaces, but also of buckets, installations for vacuuming and possibly other sets of equipment, to give this organization the right to place orders for electric steel smelting production at enterprises and in organizations of other ministries, and so forth. Then the metallurgical plant which wants to create its own steel-smelting production would have to deal not with numerous organizations for planning, design and delivery of various kinds of equipment, but with one general contractor. But at the present time not only in ferrous metallurgy but also in many other branches such a comprehensive approach to the introduction of integrated technologies is lacking and the country suffers large losses because of this.

Here is a fairly typical example.

In the Donbass an ever large quantity of coal is being extracted from the sparser beds with a thickness of less than 1.3 meters. We select 1.3 meters because the coal complex, which helps in extracting a large part of the coal in the mines, is intended for a minimum height of the drift of 1.3 meters. But if the bed is, for example, one meter thick, even the "lowest" complex will extract another 30 centimeters of empty rock in addition to the coal. In many drifts of the Donbass this is what is done and because of this there are 25 million tons of rock on the surface along with the coal. Then at the enriching plants the empty rock is separated from the coal. Expenditures on the extraction, transportation and enrichment of these 25 million tons of rock, taking into account losses of productivity, losses of part of the coal during enrichment and so forth, amount to about 600 million rubles a year according to estimates, and these losses occur because of the lack of coal complexes which could extract coal from layers that are 0.7-1.3 meters thick.

More than 10 years ago the Donetsk Coal Institute (DonUGI) and the UkrSSR Ministry of the Coal Industry developed a mechanized complex with high technical and economic characteristics for working thin beds. But of course, not having a large design bureau not to mention a production base, the institute itself could not manufacture this complex. It consigned the designing to the Dongiprouglemash which was located across the street in the same city and was under the jurisdiction of the USSR Ministry of the Coal Industry and which does not have a significant production base either. Therefore in order to produce even a couple of these coal complexes initially it was necessary to place orders in a number of machine-building plants. Need one say that it is not a simple thing to do this since all the plants are loaded with something and the desire to handle individual orders is not great. But in the end they managed to do this, the complex underwent testing successfully and there arose the question of its series production. The existing machine-building plants were loaded with series orders and it was not easy for them to adjust themselves for the output of the new mechanized complex. Moreover it contains less metal and is less complicated to



manufacture and therefore it was not easy to find a manufacturing plant. In the end they managed to place this order at a newly introduced machine-building plant which did not have experience in manufacturing complicated machine-building products. And again the drawn-out affair again fell into unreliable hands. And so 10 years passed and no real national economic effect was achieved, and the state as usual annually pays for ever-increasing expenditures in the amount of hundreds of millions of rubles.

If one were to try to calculate the unrealized effect from the prolongation of the time period for the design and production of the already developed coal complex it would greatly exceed the value of all the funds of the country's coal machine building, many years' worth of expenditures on all mining science and so forth. None of this would have happened if the DonUGI, Donuglegipromash and three to four plants of coal machine building were joined together into a unified scientific production association. Then this coal complex could have been created and its production could have been started in five to six years and billions of rubles in state funds could have been saved. Attention should be given to the fact that in this example from the very beginning everyone was interested in such a coal complex and there were no competing organizations or opponents. All this took place in one ministry. But even in this case because of the various jurisdictions of the institutes and machine-building plants the process of introduction took place very slowly. What can be said about those cases when the path of innovation is blocked by interdepartmental barriers, when new technical equipment is opposed by the head institute which has its own competing solutions for this technical problem! Then the matter drags out not for years, but for five-year plans!

Of course scientific production associations are not the only form of integration of science and production. In many cases branch and planning-design units, and scientific organizations can be included fairly simply in large associations, thus combining the plant sector with science. A good example of such an approach is provided by combines of the JDR which join together about 90 percent of all the country's scientific institutions. This has made it possible for the JDR to accelerate scientific and technical progress and relatively quickly resolve the crucial scientific production problems. It is sufficient to refer to the experience of such a well-known combine as Karl Zeiss, whose products are purchased by more than 100 countries of the world.

Our country has accumulated an immense scientific and technical stockpile. There are many scientific developments whose introduction promises a technical revolution in entire productions and branches. We have many experimental models with high effectiveness which have won praise at many technical exhibitions. It is a matter of putting all of these scientific and technical developments and models into production and extensively utilizing them in practice. Only this will produce a real national economic effect.

The new investment and structural policy.

In order to obtain a real national economic from the utilization of the achievements of science in public production it is necessary to replace existing technology and technical equipment with new ones and to technical

reequip the national economy. The course toward new technical reconstruction and accelerated reequipping of all branches of the national economy is a most important constituent part of the party's economic strategy in the modern stage. This requires a new investment and structural policy.

One can single out three main features of the new approach which was proclaimed at the April (1985) Plenum of the CPSU Central Committee and the July Conference of the CPSU Central Committee on questions of accelerating scientific and technical progress. In the first place it is necessary to change over from making capital investments mainly in new construction and expansion of capacities to technical reconstruction and reequipping of existing enterprises. In the second place it is necessary to change the ratio between capital investments in resource-extracting, processing and consuming branches, providing for priority development of resource-saving technologies. In the third place, it is necessary to provide capital investments not for increasing the quantitative volumes of production, but for improving product quality, thus achieving satisfaction of public needs with a smaller quantity of items as a result of higher quality.

Thus it will be necessary to radically change the structure of capital investments reorienting them away from directions of extensive development, with primary provision for increased resources, to intensive directions, to increased effectiveness of the utilization of all kinds of resources. This presupposes concentration of capital investments in those areas of the economy which produce the greatest return and in those branches and production which provide to the greatest degree for acceleration of scientific and technical progress.

In keeping with this the structure of the national economy must be essentially changed. It took form under the conditions of a primarily extensive type of expanded reproduction and therefore it contains an excessively high proportion of raw material branches, traditional materials, outdated technical equipment and a hypertrophied sphere of repair.

Under the new conditions of changing the national economy over to the path of intensive development it will be necessary to transform the existing structure. There should be a sharp increase in the processing of initial raw material and science-intensive branches should be given preferential development: machine building, the information industry, chemization and biotechnology, and priority should be given to new materials. It is necessary to strengthen all units but provide for efficient utilization of resources and above all the infrastructure. The entire national economic organism should thus be given additional flexibility and the ability to accept scientific and technical achievements rapidly and carry out progressive restructuring in order to provide for reliable and stable acceleration of the country's socioeconomic development.

Let us consider these problems in greater detail.

In the materials of the June Conference of the CPSU Central Committee it was emphasized that it is important to reject the stereotype of management which took form in the past whereby the main method of expanding production was



considered to be new construction while many operating enterprises were not technically reequipped for many years. As the facts show, the replacement of existing fixed production capital with new capital in the country's national economy has been carried out in insignificant amounts each year. This is confirmed by data concerning the coefficient of removal of fixed capital for 1983 (in percentages of the overall value of the capital):

<u>Branches</u>	<u>Total</u>	<u>Including machines and Equipment</u>
All industry	1.3	2.3
Machine building and metal processing	1.1	1.9

This situation led to a number of undesirable consequences:

excessive swelling of the sphere of repair because of the aging of existing capital. In 1984 35 billion rubles were spent for these purposes. For many kinds of technical equipment expenditures on repair significantly exceeded expenditures on the production of new products, and in ferrous metallurgy the annual volumes of repair exceeded the sum of capital investments;

most of the capital investments were used for new construction and expansion of capacities and new jobs were being created all the time which took workers from existing production, leaving entire sections there unmanned. Moreover the number of jobs that were introduced significantly exceeded the possibilities of increasing the number of workers. Therefore an ever larger number of jobs went unfilled and the coefficient of shift work dropped in a number of branches. In machine building, for example, it dropped from 1.69 at the beginning of the 1960's to 1.35. According to estimates, the cost of unfilled jobs in the country's national economy because of this kind of use of capital investments exceeded 200 billion rubles of the overall value of fixed production capital in the national economy of 1.6 trillion rubles);

since the existing productions were preserved and were almost not technically reequipped, the number people employed in manual labor did not decrease either. Nor were the newly introduced jobs always comprehensively mechanized, and as a result, while there were immense capital investments in production, the number of people employed in manual labor increased from year to year. Now about 50 million people are employed in manual labor: approximately one-third of the workers in industry, more than half of those in construction and three-fourths of those in agriculture;

as a result of the aging of a considerable part of the capital and its incomplete loading because the work positions were not filled the output-capital ratio decreased. With respect to the utilized national income the output-capital ratio decreased under the 9th Five-Year Plan by 16 percent, the 10th--by 15 percent and under the 11th it is expected to increase by 14 percent.

At the June Conference of the CPSU Central Committee the Ministry of Ferrous Metallurgy was thoroughly criticized. During the past three five-year plans it allotted 50 billion rubles' worth of capital investments. The majority of

these investments were used for new and, moreover, noncomprehensive construction, and they did not devote the proper attention to reconstruction and technical reequipment of enterprises. And it is no wonder that this ministry has not fulfilled the assignments of either the 10th or the 11th five-year plans.

Here is another typical example of an incorrect attitude toward reconstruction--for the coal industry of the Kuzbass. Up until the middle of the 1970's this lignite coal basin which has the most favorable mining and geological conditions (unprecedented concentration of coals on small areas, shallow positioning of large beds) was developing successfully. It regularly increased the volumes of extraction, increased labor productivity and reduced production costs. At each mine there were sections of capital construction which by the internal method regularly engaged in reconstruction of the mines. New mine construction in the Kuzbass was carried out by large specialized organizations of the Ministry of Heavy Construction. In particular, there were 15 brigades working in the Kuzbass for constructing shafts and the deepening of the mines was done more or less on time. The majority of the coal was extracted from the mines with efficient technology when the work area was located between shafts and the horizon was closer to the surface than the ends of the mine shafts. In this case the transportation of the coal requires minimum expenditures, the shaft is well-ventilated, and the preparation of new mined fields is facilitated.

Under these conditions the Ministry of the Coal Industry conducted a poorly planned reorganization. It managed to gain jurisdiction over mine construction organizations, which were transferred from the Ministry of Heavy Construction to the jurisdiction of the Ministry of the Coal Industry. Thus the internal method of construction was eliminated at the mines. The mine construction workers within the Ministry of the Coal Industry began to be used primarily for carrying out tasks of current extraction and the work for deepening and constructing new mine shafts was halted; only two of the 15 brigades remains, the skills and traditions of high-speed construction of mine shafts were lost, and the equipment was dispersed. As a result, after they had worked the horizons above the level of the mine shafts they were forced to change over to extracting coal on so-called slopes, that is, to uncover the necessary horizons below the shafts and transport the coal to be sent to the surface from the lower horizons upward to the shafts along these slopes. Expenditures on transporting coal increased sharply, and the ventilation of the mines, the preparation of new horizons and so forth became more difficult. Now up to half the coal in the Kuzbass is extracted from sloping fields and 53 percent of the mines are in need of immediate reconstruction. In order to put in order the mining system which has been neglected for the past 15 years in the Kuzbass alone it will be necessary to drill more than 100 shafts. Shaft-drilling brigades are now being created--instead of two there are now five and the corresponding equipment is being acquired, including foreign equipment. It was necessary to reinstate the internal method at the mines. But the time had passed, the reconstruction of the mines had been halted, and here is the result: the Kuzbass failed to fulfill either the 10th or the 11th five-year plans for the extraction of coal and in spite of the expansion of open-pit mining it has been standing still for a number of years now and the volume of

extraction is regularly decreasing at the mines. Labor productivity declines by an average of 2 percent annually and production costs are regularly rising.

The solution here, as in other branches of the national economy, lies in accelerated technical reconstruction and reequipment of the enterprises on a new technological basis. Now the proportion of funds used for reconstruction in the overall volume of industrial capital expenditures is one-third. A task is being set under the 12th Five-Year Plan to increase this proportion to at least half. The volume of new construction will thus have to be reduced and will be carried out only when all possibilities of increasing production with existing capacities have been exhausted. It is suggested that they deal with each construction project--accelerate the construction of some objects and halt the construction of others or temporarily preserve them. It is intended to conduct a universal inventory of production capital and develop a long-range program of technical reconstruction of each enterprise. Then even in the near future the proportion of removal of outdated fixed capital, especially the active part, should be doubled. Taking into account the start-up of new facilities, this will make it possible even by the end of the 12th Five-Year Plan to update the production of apparatus by one-third and to have up to 50 percent of the technical equipment be new.

In the new investment policy we should lean in the direction of resource-saving. And the report of Comrade M. S. Gorbachev at the conference of the CPSU Central Committee a task was set: in the future to satisfy 75 to 80 percent of the increase in the demand of the national economy for fuel, raw materials and processed materials as a result of economizing on them, which will make it possible to stabilize the proportion of capital investments used for the extraction of fuel and raw material. So far this proportion is regularly increasing. The proportion of capital investments in the fuel branches, ferrous metallurgy, the timber and wood-processing industry and the construction materials industry, that is, the complex of mainly raw material branches, in the overall investments in industry amounted to 33 percent in 1975, 36 percent in 1980 and 39 percent in 1983, and it continues to increase rapidly. The proportion of capital-intensiveness of the extraction of each ton of fuel and raw material is increasing steadily and will continue to increase because of the deterioration of mining-geological and economic conditions for extraction. This is a world-wide tendency. Now in the overall volume of capital investments made in the extraction branches more than 90 percent go, as a rule, for maintaining the already achieved level of extraction and this part of the capital investment continues to increase.

At the same time each ton of fuel or raw material that is saved now costs one-half to one-third of the amount it costs to extract them. This makes it economically advantageous to save in all ways and to extensively introduce resource-saving technologies. Many branches have the opportunity of changing over to increasing production as a result of more efficient utilization of fuel, raw materials and processed materials without increasing their consumption.

Every conference on scientific and technical progress in this connection they cited the Ministry of the Electrical Equipment Industry as an example. Under the 11th Five-Year Plan this ministry provided for all of the increase in the



production of products with an absolute reduction of the consumption of ferrous and nonferrous metals. The reduction amounted to up to 20 percent unit of products produced. They managed to achieve this as a result of changing the branch over to the output of less material-intensive products. In Issue No 6 of EKO for that year they discussed in detail the experience of changing over from electric engines of Series 4-A to mass output of competitive electric engines of series AI in which energy indicators are significantly improved without increasing the expenditure of materials. The annual economic effect from the introduction of the AI in the USSR amounts to more than 200 million rubles. A large effect is also produced by changing over to a unified series of powerful turbogenerators with water cooling, in which the material-intensiveness is reduced by 15-20 percent with an increase in the efficiency factor and the coefficient of readiness.

Another example is the development of the timber industry complex. From 1975 through 1983 the volume of the wood-processing and pulp and paper industry increased by 28 percent while the volume of timber procurements decreased during this time from 395 million to 356 million cubic meters, including commercial timber--from 313 million to 275 million cubic meters. In other words, per unit of procured timber the volume of output of the timber complex increased by more than 40 percent during these years because of more thorough processing of the timber. Yet we justifiably criticized this branch for shortcomings in comprehensive utilization of timber raw material. As we know, the output of the final product per 1,000 cubic meters is one-half to two-fifths of the best world achievements. So the reserves and possibilities are still very great.

In order to change over from the excessively extravagant economy of today to a resource-saving economy it will be necessary to do a great deal. There must be a radical change in the consumption of petroleum products, the cargo fleet must be changed over to diesel engines, petroleum must be more thoroughly processed, and gas chemistry must be organized in order to obtain liquid hydrocarbons. An immense savings on fuel must be achieved as a result of technical reconstruction of thermal electric power stations and the introduction of centralized heat supply instead of hundreds of thousands of primitive boilers. It is necessary to reduce the expenditure of fuel oil severalfold and it should be replaced by poorer quality and less expensive fuel. It will also be necessary to radically improve the utilization of secondary resources, obtaining as a result of this 10 percent and more of all the materials that are utilized. Everywhere in ferrous and nonferrous metallurgy it is necessary to achieve comprehensive and complete extraction of useful components, and in construction as a result of the introduction of lightweight elements--it is necessary to greatly reduce the weight of buildings and structures and save millions of tons of construction materials. Ferrous and nonferrous metals will be increasingly crowded out by plastics and other more effective nonmetallic materials.

Progressive new technology is realized with the help of a system of machines, equipment and instruments and therefore a key role in reequipping the national economy and carrying out the scientific and technical revolution is played by machine building. The party has set the task of radically improving the attitude toward the machine-building complex. It seriously considered the

existing situation wherein of all the production capital investments under the 11th Five-Year Plan considerably less were used for machine building than for branches for which machine-building products are manufactured. For example, in machine building for agriculture they invested one-eighteenth the amount of money, in the production of machines and equipment for light and the food industry--one-23rd, in heavy and transport machine building--one-28th, and in chemical and petroleum machine building--one-47th of the amount for the corresponding branches.

During the past years of the 11th Five-Year Plan the proportion of machine building in the overall capital investments in industry have decreased. This tendency should be changed.

The decree adopted in August of this year by the CPSU Central Committee and the USSR Council of Ministers concerning measures for radically raising the technical level and improving the quality of machine-building products and developing machine building as a basis for scientific and technical progress envisions priority development of the machine-building complex. The growth rates of capital investments in machine building will increase 4-5 times more rapidly than in other branches of the national economy. Here special attention will be devoted to microelectronics, computer equipment and instrument building as well as the entire information industry which exerts a decisive influence on the effectiveness of means of labor and technological systems in all branches.

Recently the party Central Committee and the government have adopted a number of decisions for stepping up the development of important branches of machine building which determine technical progress: for flexible automated productions and robot equipment, for rotary and rotary-conveyor lines, for computer equipment, for machine building for light and the food industry, and a number of others.

#### In-Depth Restructuring of the System of Planning and Management, and the Entire Economic Mechanism

In the report of Comrade M. S. Gorbachev at the July Conference of the CPSU Central Committee he deepened and concretized the main directions for improving the system of management in the country which were set forth at the April (1985) Plenum of the CPSU Central Committee. With extreme clarity he laid out the main paths for this improvement. "We must," said Comrade Gorbachev, "proceed along the line of further strengthening and development of democratic centralism. Increasing the effectiveness of the centralized basis for management and planning and considerably expanding economic activity and responsibility of enterprises and associations as well as actively utilizing more flexible forms and methods of management, cost accounting and commodity-monetary relations as well as the entire arsenal of economic levers and stimuli--these comprise the principal essence of the restructuring."<sup>4</sup> The entire system of management and the entire economic mechanism is to be directed toward providing fuller satisfaction of public needs. For the first time the economic mechanism has been given the task of surmounting the dictatorship of the producer over the consumer and eliminating the shortage both of means of production and of objects of consumption. It will be



necessary to make the economy dynamic, balanced and maximally receptive to scientific and technical progress and to provide for strong motivation and irreversible responsibility of all units of the national economy for the introduction of the latest achievements of science and technology and for the achievement of leading positions in the world.

It is intended to begin the in-depth restructuring of the system of planning and management with the upper echelons and primarily with a radical increase in the role and responsibility of the USSR Gosplan as the central unit for management of the economy. The Gosplan must become the country's scientific economic agency which has a concentration of eminent scientists and leading specialists. This will make it possible to make new technical equipment and technology a bearing structure for the entire national economic plan and provide a leading position for indicators of effectiveness. A great deal of significance is attached to changing planning over to normative methods, which will create conditions for increased activity of associations and enterprises and will provide an impetus for initiative and creativity of labor collectives.

Important tasks have been set for the State Committee for Science and Technology. It must concentrate most of its attention on the prediction, selection and substantiation of priority directions for the development of science and technology. In this connection an important role is assigned to the Comprehensive Program for Scientific and Technical Progress which is being developed by the USSR Academy of Sciences and the Committee for Science and Technology.

Something new in the proposals for improving management is the statement of the problem concerning the creation of management agencies for large national economic complexes of the branches so as to resolve interbranch problems more successfully. Under these conditions there is a significant change in the role and functions of the ministries which are to concentrate attention on long-range planning of scientific and technical progress and improving the qualitative level of production and products while refraining from becoming involved in the trivial affairs of the enterprises.

Now the majority of associations and enterprises, as we know, are under the jurisdiction of all-union industrial associations (VPO's) and through them--the ministry. Thus a three-level system of management prevails. It is suggested that we increase the role of the main production unit--the associations and enterprises, shift the center of gravity of all operational and management work and make the associations and enterprises, as a rule, directly under the jurisdiction of the ministry, that is, change to a two-level system of management. All this will make it possible to essentially reduce the management staff in the branches and eliminate superfluous units of it.

On the whole the production associations have proved their effectiveness. But when they were formed they were formed within the narrow framework of all-union production associations and branch ministries, and the territorial location of the enterprises included in the association was not always substantially taken into account. It is suggested that we improve the

structure of organization of industry and form associations on the basis of enterprises, regardless of the departmental or territorial jurisdiction of the latter. Thus the path will be open to the formation of interbranch associations. It will be important to single out in individual branches the leader associations which have a powerful scientific and technical potential. These associations will be placed in a privileged position and will be the first to develop; they will take jurisdiction over those enterprises and organizations which are operating less effectively.

At conferences conducted by the CPSU Central Committee with managers of associations and enterprises and also conferences concerning the acceleration of scientific and technical progress they disapproved of the attempt on the part of the ministries and departments to use departmental recommendations and instructions to limit the rights granted to associations and enterprises. In this connection they criticized the inadequate consistency in conducting the large-scale economic experiment in which the new methods of management are proceeding with difficulty and are encountering obstacles. The CPSU Central Committee and the USSR Council of Ministers recently adopted the decree "On Extensively Disseminating New Methods of Management and Increasing Their Influence on the Acceleration of Scientific and Technical Progress," in which measures are envisioned for further development and deepening of the experiment and extending it to a number of new branches. Here it is intended to provide real rights and independence for the associations and enterprises, mainly in the utilization of incentive funds and in increasing incentives for improving product quality and accelerating scientific and technical progress.<sup>5</sup>

At the conference of the CPSU Central Committee concerning scientific and technical progress they earmarked the main directions for improvement of the system of cost accounting [khozraschet], economic levers and stimuli. They set as their central task changing associations and enterprises over to complete cost accounting, having sharply reduced the number of centrally established planning assignments. The associations and enterprises must have complete disposal of their financial resources and must independently select the most efficient ways of conducting business and increasing effectiveness. While increasing the responsibility for the final results of production it is necessary to give them the opportunity to earn the necessary funds for themselves and to dispose of them. To do this it is intended to expand the limits and rights to utilize the fund for development, amortization deductions, additional profit and credit, and to give priority allotment of modern equipment and limits on construction and installation work for these funds.

In order to strengthen the role of economic methods of management, a task was set to radically improve price setting so that it will contribute to more rapid introduction of everything that is new and advanced, literally forcing managers to improve technical equipment and to economize. In order actually to subordinate production to the satisfaction of public demands it is suggested that measures be taken for strengthening the influence of the consumer on the technical level and quality of the products. In particular, there is to be a changeover to wholesale trade as resources are accumulated, an increase in the role of direct ties and economic agreements, and so forth.

As we know, at the present time the level of payment practically does not depend on effectiveness, on whether a good or a bad product is produced. It is intended to establish direct ties here.

This will be achieved by extending the principles of the collective contract to the activity of associations and enterprises so as to establish a close link between the results of the collective and the system of payment for labor. This innovative approach to constructing the system of material incentives will make it possible to solve the problem set by the April Plenum of the CPSU Central Committee of combining the restructuring of the system of management from above with the initiative of labor collectives from below for a changeover to comprehensive cost-accounting brigades which are directed toward the final results.

At the conference it was noted: "It is necessary to boldly eliminate everything that is outdated so as to put to work at full force the "anti-expenditure economic mechanism," as it were, which would stimulate the development of the economy, would literally slap the hands of unconscientious managers, people who like to take from the state more resources and capital investments and to give less."<sup>6</sup>

Time periods have also been earmarked for conducting the work for improving the system of management. This work should be completed in a short period of time so that under the 12th Five-Year Plan all branches of the national economy can be changed over to the new methods of management and administration. It was emphasized that without creating new economic and organizational conditions it is impossible to actually accelerate scientific and technical progress.

If one were to try to use one key word to express the essence of the demands made at the April Plenum of the CPSU Central Committee and the conference of the CPSU Central Committee regarding questions of acceleration of scientific and technical progress it would be the need for a turning point in economic, scientific-technical and social development. And the turning point in all respects should be the next, the 12th Five-Year Plan. And a decisive factor in the change is the human factor. In this connection a major point was advanced for party work--to create a radical change in the lines and moods of personnel from above to below, to concentrate attention on the most important thing: scientific and technical progress. A task has been set to provide incentive for modern approaches to scientific-technical, socioeconomic and ideological-educational problems. "We cannot be slow," Comrade M. S. Gorbachev pointed out, "and we cannot wait, because there is no time left to get ourselves going, it was used up in the past. We can move only forward, gathering speed."

#### FOOTNOTES

1. See the articles in EKO No 6 for 1984 and No 8 for 1985.

2. Here the author is trying to develop the ideas expressed at one time by Professor V. S. Muchnik in EKO (No 2, 1979; No 12, 1982) and also in greater detail in the book by V. S. Muchnik and E. B. Golland, "Ekonomicheskiye problemy sovremennogo nauchno-tehnicheskogo progressa" [Economic Problems of Modern Scientific and Technical Progress], Novosibirsk, "Nauka", 1984.
3. The experience of these associations has been written about in detail in EKO: see No 6 for 1984 ("On the Nikolayev Association for Producing Lubrication Equipment") and No 9 for 1985 ("Svetlana"). A selection of articles using the experience of "Kriogenmash" is being prepared for one of the next issues.
4. M. S. Gorbachev, "A Radical Question of Party Economic Policy," Politizdat, 1985, pp 22-23.
5. PRAVDA, 4 August 1985.
6. M. S. Gorbachev, op. cit., p 28.

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## ROLE OF INTENSIFICATION IN SCIENTIFIC AND TECHNICAL PROGRESS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 32-57

[Article by S. A. Kheyman, doctor of economic sciences, Institute of Economics of the USSR Academy of Sciences (Moscow): "Intensification and Scientific and Technical Progress"]

[Text] Direct and reverse ties exist between intensification, the most important condition for increasing the effectiveness of production, and acceleration of scientific and technical progress. Frequently in the press the process of intensification is reduced to increasing the productivity of live labor (that is, they regard the share of the productivity of live labor in the increase in output as a measure of intensification--the share of the intensive factors). In turn, scientific and technical progress is fairly frequently interpreted as the creation and introduction of principally new technical equipment, irrespective of the preparation for progressive organization of production both in the stage of the manufacturer of this technical equipment and in the stage of its utilization in the branches where the new technical equipment is to operate. In our opinion this approach is inadequate. It does not reflect precisely enough the essence of intensification or the specifics of scientific and technical progress under the conditions of intensive development of the economy.

### Intensification--the Basic Variables

A mandatory characteristic of intensification and its most important constituent part is the increase in the productivity of the total resources used in the process of production. The product--the result of production--should increase more rapidly than the total expenditures on production.

This characteristic of intensification pertains also to scientific and technical progress itself: its productivity--the return from each new technical solution, from each new generation of the given technical

equipment--should increase steadily. This is a key characteristic of scientific and technical progress in action, a characteristic which is determined by the course toward intensification.

Consequently, intensification should provide for a savings on live and past labor or a savings of either one of these which will exceed the increase on the expenditures of the other element and thus provide for a savings of the total labor. Crucial as the increase in the productivity of live labor may be, the society is not indifferent to the price at which this is achieved. If labor productivity increases more slowly than the capital availability does (and this is precisely the situation that existed in the 1970's and in 1981-1984<sup>1</sup>), this means that the organization and structure of production nullify the possibilities of introducing their new technical equipment. Thus the increase in this productivity is, one might say, largely extensive in nature since it is achieved as a result of increasing the resources of past labor, in this case--fixed production capital.

Saving on past labor as a necessary variable of intensification and, consequently, of effectiveness is extremely important for the key proportions of reproduction.

An increase in labor productivity which lags behind the increase in capital availability, that is, which is taking place under conditions of a reduction of the output-capital ratio and an increase of material-intensiveness, leads to more rapid growth of the first subdivision--the production of means of production. This, in turn, means that the production of means of production is forced to operate increasingly for itself, for providing for an increase in the former subdivision. Consequently, there is a slowing up of the allotment of production funds necessary for increasing the second subdivision. Thus the growing relative savings of fixed capital (growth of output-capital ratio) and savings on material expenditures constitute one of the main constituent parts of processes of intensification.

Increasing the productivity of all production resources and making sure that the increase in the results of production are greater than the expenditures on it means also that a necessary constituent part, the core of the process of intensification, along with progress in technology and technical reequipment, is systematic improvement of the organization of production and labor, the creation of conditions for optimal utilization of available and newly created production and scientific-technical potential. We are in no way playing down the key role of scientific and technical progress. But one must firmly establish the concept according to which without the improvement of the structure and organization of production technical reequipment, necessary as it is, does not guarantee intensification. Moreover, even with the available technical equipment progress in structure and organization can provide during individual time segments for intensification of the utilization of the available production resources. These possibilities, of course, are limited in time. They can become long-term in nature only on the basis of simultaneous further technical reequipment.

In a socialist society the very process of intensification should have a long-term strategic direction. When comparing the results of production with the

expended resources one must take into account not only the expenditures of live and past labor, but also certain expenditures of future labor that are related to the necessity to compensate for harm caused to the national wealth by current production and, consequently, expenditure of resources on restoring reproduced and replacing nonreproduced natural resources which are used during the process of current production. The procurement of timber with any ratios of results and expenditures will not be intensive. If there is not the necessary reproduction of the environment (forests), which is not only the place where timber is located, but is also the location of numerous other goods (fruits, game, a place for recreation and so forth). The situation is the same with respect to the active and rapid withdrawal of nonreproduceable resources--fuel, ores and nonore minerals as well as the utilization of soil in agriculture. It is necessary to guarantee a certain reimbursement of those additional expenditures which will be required in the future in order to satisfy the needs of future generations for these kinds of resources.

In spite of numerous discussions we have not solved the problem of evaluating natural resources and introducing payments for them. This is a serious impediment to the correct evaluation of the effectiveness of public production. The evaluation of the processes of intensification and the correspondence between the expenditures and results should take into account expenditures from the process of reproduction of natural resources and elements of the biosphere.

The interpretation of the expenditure-output ratio is important, but it is not the exhaustive characteristic of intensification and effectiveness of the economy of a developed socialist society. Another essential characteristic is the ensurance of the preservation and minimization of losses of the public product in all stages of its reproduction. Structural measures which are to provide for this aspect of intensification are linked to the preferential development of branches of the production infrastructure: transportation, warehousing, elevator and packaging businesses, a progressive system of material and technical supply, and communications. In our opinion, the course toward intensification dictates the need to be guided by the following principle: while increasing the production of additional resources and providing for even higher growth rates of the final product, one must take all possible measures to eliminate factors which give rise to losses of these resources. Here one should be guided by the concept of the convertibility of losses into investments. One piece of evidence for this proposition is the importing of a number of products which replace the losses of these products. Investments which provide for reducing losses of a number of products can frequently be more than covered by reducing the volumes of losses.

Problems of losses of the public product are most closely linked to the possibilities of intensification and the volumes and structure of investments. They are linked to the volumes because it is necessary to allot resources to make up for losses. They are linked to the structure since the determination of it requires knowledge of the anatomy of the losses.

The formation of criteria which determine the priority directions of investment decisions and the paths of intensification requires, in addition to everything else, the creation of an accounting and statistics base. It can be



a systematic, precise and directed base with a designation of the volumes, value and causes of appearance, and it must take into account direct losses of the social product and unrealized possibilities that are related to unsatisfactory technological and organizational decisions. It should stimulate a broad search for ways of eliminating losses. Losses should not be concealed, but disclosed, and the "anatomy" of these losses should create the possibility of determining ways of eliminating the factors that gave rise to them. One should calculate the volumes of the social product minus all losses. This will make it possible to determine the effectiveness of the fight against them. If they are not excluded from the volume of the produced product (and until they are) all measures and the actual reduction of losses cannot show the effect since the increase in output will not be revealed in the statistics. Obviously in the methods that determine the effectiveness of investments in the production infrastructure, in the production of goods and so forth one should also take into account the increase for the society of those products (and their value) which will be preserved and which will provide savings and protection from losses.

It seems that the fight against losses in the national economy should assume the nature of a broad, long-term public campaign and it should be given maximum publicity. It would be expedient to form a party-state commission for fighting against losses and to create its peripheral-regional and branch analogues, and, perhaps, a special journal so that the broad public will engage in the disclosure of losses, the analysis of their anatomy and the development of ways of eliminating them.

Intensification in a developed socialist society should be inseparably linked to collectivization of production in reality, which was discussed by V. I. Lenin.<sup>2</sup> It should be directed not only toward more economical and productivity utilization of all resources in the process of producing the product, but also toward making sure that the product of production satisfies the demands of the consumer most completely and economically in the process of the utilization and operation of this product. Orientation toward the consumer is the most important constituent part both of the process of collectivization and of the process of intensification. Consequently, it is not simply a matter of delivering new (newly produced) technical equipment, but of making sure that it is "cut to fit the consumer"--by the most progressive method--and that it effectively carries out those tasks which it is intended to carry out.

An active interest on the part of the producer in optimal functioning of his product during its entire life cycle should be the legal norm, envisioned by standards, everywhere.

With respect to machine building we are speaking of radical changes in its role in the investment process. This means, above all, releasing the technical equipment to the consumer ready to use, providing warranty service for installation, assimilation and operation of the technical equipment, providing firm-supplied repair and modernization, that is, creating everywhere authentic machine services, and fully providing the manufactured technical equipment with parts and components for replacement and repair according to scientifically substantiated norms as well as special instruments and the



necessary fittings. All these measures considerably reduce the time of assimilation and increase the output from new technical equipment, that is, they accelerate scientific and technical progress and at the same time they create extremely necessary feedback from between the consumers and producers of the technical equipment, which will contribute to raising the technical level of the machines and instruments that are produced.

Lenin's "Collectivization of Production in Reality" cannot be reduced simply to orientation toward the consumer. A most important manifestation of this requirement is progress in division of labor and progress in specialization and cooperation which is related to it. All the experience of developed countries convincingly demonstrates that a high level of technical equipment depends not only on making sure that its design meets technical specifications, but also on how this technical equipment is used. Either at highly specialized enterprises with functional specialization and an advanced art of production of the given kind of technical equipment using components that are created taking into account the latest achievements, or at "their own attached sections" in "their own" head mechanic's division, using the materials that are at hand.... The real effect of newly created technical equipment and its contribution to the progress of the economy and the society as a whole depend on this.

Intensification and effectiveness are unthinkable without specialization, and "collectivization of production in reality" presupposes the strictest and unwavering fulfillment of cooperative deliveries, precisely on time. Such things as "subsistence farming," semiprimitive manufacture "for oneself," "through one's own forces" which are expensive and do not last long--these are the antipodes to intensification.

Another important condition for following through the course toward intensification is the strictest observance of the correctness of report data concerning expenditures and the results of production and an uncompromising battle against write-ups, adjustment of the plan, a truthful determination of the level of management, its actual results, and this means, the actual measures of intensification.

Truthfulness is also an economic category. Each management unit (and, consequently, the managers of all levels) should appear in its true form, without embellishment or "makeup." Herein lies the guarantee of improvement of production activity. Economic indicators should reflect the real results of production activity which are suitable for utilization and consumption and the real losses appearing during the process of production and circulation. This is one of the most important conditions for balanced development of the economy and balanced plans. Deliberately distorted results of economic activity lead to an erosion of moral qualities and stimulate alienation of the worker from the process of socialist production.

But considering truthfulness as an economic category we must keep in mind not only the moral and philosophical qualities of the subjects participating in public production, and not only the strengthening and effectiveness of the control and inspection functions, but also the economic incentives which would

make truthfulness a necessity for these subjects. We are speaking about the economic mechanism which should create these stimuli.

Here it is necessary to distinguish the "varieties of untruthfulness." In economic practice there is "direct untruthfulness"--taking credit for products that have not been manufactured; charging production for nonexistent expenditures; concealing losses that have taken place; receiving and dispatching products that are known to be of poor quality; selecting indicators that are known to artificially inflate production volumes. There are also quite legitimate summary, especially dynamic indicators behind which untruthfulness can actually be hidden--"concealed untruthfulness." This is measuring the dynamics of products in tons, rubles and units that do not reflect the real effect of the given product; indicators of gross output which are increased as a result of the creation of artificial cooperation, especially in machine building.

There exists "veiled untruthfulness" in the most varied forms--the establishment of prices that include actual expenditures which cover up inefficient management and create the appearance of well-being in the dynamics of production; favorable indicators of product sales which ignore their real acceptance by the consumer (footwear and so forth); favorable indicators of fulfillment of the plan that are based on adjustments to the plan by higher organizations and "diversions" of the plan to other enterprises; the lack of current indicators that characterize the real utilization of fixed capital not only in terms of time but also in terms of capacities, and so forth.

The development of a system of organizational and economic measures which would create a reliable dam against all of these and other kinds of untruths is a difficult and a collective matter. We shall name only a couple of these measures:

a statewide, precise and public accounting for losses of the social product in all stages of its reproduction and a determination of the anatomy of these losses--volumes, character and causes;

credit for producers against products that have been dispatched with final repayment after the sales to the final consumer and, only on a basis of this, a determination of the volume of products that are produced, that is, a determination of the true results of production by the consumers of the product;

orientation of the established prices not toward the actual, but toward the socially necessary, normative expenditures;

a revision of indicators for accounting for products and an orientation toward reflecting their real value in the process of utilization by the consumer;

utilization as indicators determining material incentive funds not percentages of fulfillment of a plan, but the increase in real volumes of output and profit (with an orientation of prices toward socially necessary expenditures);

as a general rule--a refusal to make adjustments to the plan, with the exception of special cases that are sanctioned on a governmental level.

Such, in our opinion, are the basic variables and criteria of intensification, although they include far from all of them. It would seem that, taking into account the peculiarities of the modern period and the concept of intensification that has been presented, one should also interpret the characteristics of scientific and technical progress and its modern stage--the scientific and technical revolution.

#### The Scientific and Technical Revolution--Condition, Stages, Prospects

When investigating the economic problems of scientific and technical progress (and also the scientific and technical revolution) we must consider scientific and technical progress (the scientific and technical revolution) in action--not only in the accomplishments of human genius and in individual technical exhibits that demonstrate these achievements, but we must concentrate our attention on the possibilities of scientific and technical progress (the scientific and technical revolution) which are realized in public production--its material and nonmaterial spheres. It would seem that this quite obvious thesis is extremely important.

The scientific and technical revolution is continuing in keeping with the logic of the development of the sciences themselves, with a rapidly growing volume of information concerning the processes that are taking place in the macro- and microworld, in keeping with the growing demands of mankind and public production.

Several important and highly promising new tendencies can already be seen. In the area of the energy basis of production there is an improvement of the technological and ecological aspects of atomic energy engineering and one can see the outlines of prospects that are fairly distant in time but already real for thermonuclear energy as well as the growing utilization in the energy balance of nontraditional sources of energy and also the steady progress in reducing the energy-intensiveness of production.

A broad spectrum of radically new technologies and new--electric, radar, electronic, chemical, electrochemical and also biological--means of affecting objects of labor are regularly being created and introduced into production.

In the area of automation of production these include microprocessors in which one of the major principles of automation and cybernetics is materialized: the principle of feedback. Microprocessors are a triumph and at the same time the basis of microminiaturization, microelectronics and a possible basis for optimization of numerous processes in production and the nonproduction sphere and also a condition for the development of flexible automation.

Machine tools with numerical program control and processing centers, programmed and reprogrammed robots, automated transportation-accumulator systems with remote control, electronic computers, minicomputers and, of course, the utilization of microprocessors for controlling production--both individual aggregates and sections, shops and enterprises as a whole. The



computer can already control not only working mechanisms of machine tools and other machines that perform technological operations as well as control the condition and the change of instruments, but also processes for moving objects of labor from one operation to another and production as a whole--developing optimal plans for the production of products, and schedules for the input and output of items. They organize the process of their fulfillment and continuous control and regulation of the preparation of production according to the urgency of the manufacture of products in orders, control over warehouse accumulators, monitoring of the location of items in the production sections, control over the movement of blanks, semimanufactured products, instruments, technical specifications and so forth.

In the area of materials, along with further progress in the production of polymers and successes of solid state physics and its influence on the structure of substances, the physics of unordered systems is growing in significance. Its objects are amorphous, unordered substances--ceramics, glass--which have extremely great prospects in a wide range of construction materials and in the development of microelectronics, the theory of ideal crystals and crystals with isolated irregularities. Research in the area of creating framework (superdurable) polymers biologically compatible and biologically decomposing polymers, and polymers with enzyme-like behavior make it possible for polymers also to acquire a "second breath"--there are prospects for their utilization as bearing structures, ecological problems related to the nondegradability of polymers are removed, and so forth. Prospects are opening up for a new upsurge of the production of polymers and more intensive replacement of metals with them.

Materials which for many centuries have maintained a high level of inertia are being transformed into an active and increasingly controllable element of productive forces.

Biotechnology, bionics and genetic and cellular engineering comprise another most important complex of possibilities of the modern stage of the scientific and technical revolution which are revolutionary in their significance, and they are a most important constituent part of the new stage of the scientific and technical revolution whose establishment can be expected in the foreseeable future. The realization of the possibilities of bionics--the utilization in material production of principles of functioning of living substances (cell, muscle, nerves, brain) which are unprecedented in technical equipment in terms of their economy and effectiveness--in the long-range future can bring about truly revolutionary changes in all elements of production. Biotechnology and genetic and cellular engineering can make radical changes in the technology of a wide range of branches and provide new, considerably more targeted and powerful means of influencing the results and the effectiveness both of agricultural and of industrial production.

It is necessary to react flexibly to the new tendencies and strive to adapt them to the production and scientific-technical potentials of the society. But it is also necessary to be aware that a large amount of long-term work will need to be done to mobilize the investment resources and to overcome the inertia of the existing production apparatus and the existing structure of technologies of the main production complexes.



Many scientists and journalists are writing hopefully about a new scientific and technical revolution, about a revolution of microprocessors, a "biogenetic revolution," and so forth. There is no doubt that it is necessary to carefully study the latest tendencies in the scientific and technical revolution and exert all efforts so that they do not bypass us and are developed and embodied in production. At the same time it should be emphasized that the authors who describe the miracles of the scientific and technical revolution frequently do not expend the labor to analyze them or to analyze the situation with respect to the current scientific and technical revolution and its basically realistic technical possibilities. As we know, revolutions either run their course, or they are defeated, or they continue. Has the scientific and technical revolution been victorious?

Let us consider the report data: the share of atomic electric power stations in the production of electric energy in 1980 in the United States was 11.5 percent and Japan--14.4 percent; the world smelting of steel in 1980 was 719 million tons and the production of synthetic resins and plastic in 1983 was 60 million tons, but at the present time plastics are not used very much to replace metal (10-15 percent). At the end of 1983 machine tools with numerical program control comprised 5.5 percent of the machine tool fleet in machine building in the United States, processing centers--1.4 percent, electrical and electrical mechanical machine tools--0.7 percent, and robots with program control--2,744 units or 0.125 percent of the fleet of metal-cutting machine tools and forge and press machines. These figures are still somewhat less in the USSR except for the number of robots.

It is obvious that the major (technically resolved) "brainchildren" of the scientific and technical revolution have neither prevailed nor even been equal in proportion to the pre-scientific-and-technical-revolution technical equipment and technology, and with respect to many positions they even account for an extremely small proportion. To realize the possibilities of the scientific and technical revolution, to overcome the immense force of inertia and to achieve at least equality in terms of the proportion not to mention a prevalence--this is a difficult and extremely long-term task which requires consistent and purposive systems of organizational measures in the area of planning, price setting and incentives.

The coexistence of the modern and the newly formed stages of the scientific and technical revolution and an optimal utilization of their possibilities in interaction with the existing technical and organizational structure of public production--herein, one might say, lies the essence of the economic problems of the scientific and technical revolution up until the end of the 20th century and possibly into the beginning of the 21st century, and also the main task of the scientific and technical policy.

Modern science is a highly capital-, asset- and material-intensive branch of public production, an important constituent part of the material and technical base of developed socialism. Complexes of branches of scientific instrument building, the production of complex chemical reagents, complexes of branches of machine building which materialize new technical equipment and so forth should be formed in the economy.

It is obvious that the "contributions" of the economy to the development of the scientific and technical revolution should be directed with target precision. This gives rise to the need to develop and consistently implement a unified state scientific and technical policy. By investigating the structure and tendencies toward change in public demand and the logic and tendencies of development and the possibilities of science and technology, it is called upon to determine the structure of resources allotted to science, the structure of training of personnel, the nature of the problems on whose resolution the efforts of science should be concentrated, and the necessary changes in the structure of the energy base and the structure of technologies, and the production apparatus, in the material and raw material balance, and in the structure of the information base.

The scientific and technical policy, in our opinion, should also envision the solution to a number of organizational and technical problems: the amortization policy; the norms for the removal of production apparatus; the ratio between replacement and modernization of equipment as forms of updating it; orientation norms for increasing the effectiveness of each subsequent generation of technical equipment; the organization of processes of its repair and modernization, and so forth.

#### The Organization of Production

Accelerating scientific and technical progress and transforming it into actually operative change, into technical reequipment of the production apparatus, and its effective utilization are linked to an extremely important element in the functioning of production--the complex of problems related to the organization of production. This organization is the unifying fabric which provides for effective and purposive functioning and interaction of all elements of productive forces in the process of the functioning of production; effective adaptation of new technical equipment and acceleration of scientific and technical progress; expedient division and cooperation of labor and functions at all hierarchical levels of production, and high effectiveness both of the immediate production process itself and of all preceding and subsequent stages of it.

A consideration of the organization of production at the level of production units themselves (from the section to the enterprise) requires a refinement of the content of two categories: technology and production organization.

If technology--the combination in time and space of personal and substantial elements of production--is attached directly to the production of a given final product, then the object of organization of production at the level of the production unit is the given production subdivision--section, shop, enterprise. The process of production is carried out within it, and its organization and functioning in time and space provide for continuous and effective realization of technology. Here we are speaking not only about the process of manufacturing the given product itself, but also about the creation of all conditions which provide for carrying out this task: all of the actions and procedures which are linked to it and provide for it--preceding and accompanying--including spatial planning of the production subdivision

(organization of production in space), the selection of forms of intraplant and intraprocess material and informational ties, and the organization of the work place and processes of serving production. In essence we are speaking about the movement of material and information flows which are oriented in space and time. The quantity of qualitative condition of these flows, the degree of their regularity and continuity, and their proportionality and rhythm characterize the degree of perfection and the quality of organization of production.

It seems that the organization of production as a system in the broad sense of this concept consists of three subsystems.

1) The organization of the process of the functioning of productive forces itself at the level of the enterprise and the branch.

2) The economic mechanism--planning and stimulation of production, a combination of centralized planning and independence of production units, the principle of price setting and cost accounting, and so forth. The subject of even the most automated production has been, is and always be man. The economic mechanism acts as the main drive from the subject to the object and the drive for feedback--from the results of production to its subject, to management. It thus determines the behavior of the subject, his actions and reactions, that is, in the final analysis, the successfulness and effectiveness of the functioning of production.

3) The institutional aspects of management of production which are called upon to provide for efficient interrelations among the production units themselves and the associations, branch ministries, regional agencies and the Gosplan.

Each of these subsystems has its own hierarchical structure and developed principles of functioning.

A) At the level of all material production the solution to a group of organizational problems consists in providing for balance of plans and consistent formation of sufficiently mobile reserves for production and production capacities that contribute to flexible satisfaction of all the demands of the producers and the consumers.

B) At the level of the branch and the complexes of branches organizational problems are linked to specialization, cooperation, combination and concentration of production on the basis of extensive standardization, normalization and unification of components and parts both on the scale of the group of branches and within the enterprises and associations.

C) At the level of the primary production unit the organization of production encompasses efficient organization of production in space, specialization of shops, sections and work places and organization of progressive methods of labor in them; efficient organization of all service units; the creation of optimal conditions for production in order to eliminate all possible losses of working time, and the reduction of production outlays and the length of the production cycle.



The practice of certification of work places which was approved by the CPSU Central Committee is one of the most important parts of the work for organizing production. Its consistent introduction everywhere will be of great positive significance. But certification of work places by no means solves all the problems of improving the organization of production. They include streamlining of all intraplant and intrashop ties, distribution and movement in time and space of all substance and information flows, including ties between the work places, and the combining of these work places into production sections, shops and divisions.

From the specific to the general and from the general to specific are the impulses from the assembly conveyor to the machine assembly and procurement shops and to each work space in these shops and the impulses that go in the reverse direction (streamlining of direct ties and feedback)--these comprise one of the most important complexes of work which form the object of organization of production.

This object also encompasses external material and organizational conditions which provide for continuous and effective functioning of the aforementioned units. All this are conditions for effective utilization of the available production potential and more rapid assimilation of recently increased capacities.

The organization of the direct process of production is composed of the following subsystems: technical preparation; organizational preparation; organization of the main production process itself; servicing of the production process--organization of the functioning of auxiliary services; and management of the production process.

Scientific and technical progress with its current capabilities sharply accelerates the replacement of technologies, types and models of equipment and multiplies the products list and modifications of this technical equipment. There is a corresponding increase in the proportion of small-series and unit production. This process leads to a dialectical contradiction with durability, specialization, complication and increased costs of existing technologies and means of labor, and it brings to the fore as one of the central economic problems of scientific and technical progress the provision of flexibility of production: technology, technical equipment and organization, the ability to adapt to the dynamic nature of scientific and technical progress rapidly and without significant economic losses.

The most important prerequisites for solving this general problem are mainly organizational and industrial in nature. At the same time scientific and technical progress creates material conditions for a radical improvement of the processes of production organization themselves. A combination of scientific and technical progress and progressive organization of production is a key task in the current and future stages of the development and improvement of the material and technical base for developed socialism.

The organization of production involves a group of problems which are at the juncture of the process of intensification and the processes of realization of the possibilities of scientific and technical progress and the scientific and

technical revolution. It has acquired special significance in the modern and foreseeable stages of the development of our economy when the combination of these two processes forms the major content of the improvement of the material and technical base and the economy of mature socialism in the USSR. A completion of the changeover of the economy to the intensive path of development is linked in the strongest way to the utilization of organizational resources of production. Acceleration of scientific and technical progress and the formation, creation and introduction of principally new technologies and technical equipment as well as radical changes in the main characteristics of production forces are also dependent in many ways on improvement of production organization.

With respect to machine building, which materializes scientific and technical progress, there are certain general organizational-production conditions for the intensification and acceleration of scientific and technical progress which operate at the level of the enterprises and branches that form the machine-building complex.

Above all these include unification and normalization of components (especially functional components), modules and parts of technical equipment. This makes it possible to organize mass specialized and flexible production of functional components, modules and parts of traditional and very modern technical equipment which is produced not only in large, but also in small series and even as single units.

The functional approach to the planning production and evaluation of the effectiveness of each functional component and new equipment as a whole, which should be produced with maximum utilization of unified modules, components and parts, acquires a most important role.

The spatial organization of production becomes very significant: expedient and flexible planning of production sections, the placement of equipment and power communications, points of technical control and warehouses, the selection of means of transportation and floor, suspended, continuous and noncontinuous conveyance, and also standardized containers (palettes and so forth) that are adapted to intrashop and intrawarehouse means of transportation (especially automatic loaders with forklifts) which would provide for minimization of the distribution of raw material and also the capability of rapidly restructuring for new kinds of production and products.

Expedient planning and equipping of warehouses is involved with the processes of conveyance. A large part of the workers in manual labor are employed in the sphere of conveyance and warehousing. Mechanization and automation of this work without preliminary improvement of its organization is economically quite unjustified. Improvement of spatial organization makes it possible to eliminate many unnecessary movements. This is the intensive path to reducing manual labor. At the same time improvement of the organization of production in space contributes to reducing the duration of the production cycle and accelerating the production process.

A broad complex of organizational problems is involved with improving processes of preparing production, operating, maintaining and repairing

equipment, and also obtaining, manufacturing and providing for the functioning of technological fittings and instruments. All this contributes to accelerating scientific and technical progress.

In our industry and--which is especially important--in machine building there is practically no service for organizing production either at the enterprises or in the associations, and practically nobody handles the entire complex of these problems as a whole. It is worth remembering that in industrial (and especially machine-building) concerns of the United States there are vice presidents for the organization of production, services for organizing production at plants, and engineers for organizing production in the shops.

#### Concentration, Specialization and Cooperation

The main feature of the modern stage of production organization was conditioned by a principal change in the technical base of material production. The growing invasion of production by electronics and other principally new technical equipment brings about a real need to rethink the entire system of production organization. The list of items is expanding rapidly, they are becoming more complicated and their technical level is rising, and there is an increased number of components and parts that form modern technical devices.

These tendencies radically change the content of the processes of production concentration. The content and criteria for concentration are no longer volumes--the value of fixed capital and output, the number of workers. The high level of specialized production of homogeneous products and combination--sequential processing of one and the same initial raw or processed materials--are becoming the basis for expedient concentration in the age of the scientific and technical revolution. This approach opens up possibilities of gradual development of medium-sized and small highly specialized enterprises with technological, part and, the main thing, functional specialization, which are equipped with modern technical equipment that provides for the output of highly progressive complicated technical equipment consisting of first-class functional units and modules. This is also one of the parts of concentrated production which will be extremely effectively combined with large enterprises with object specialization. This direction of specialization will simultaneously solve also the problem of the utilization of labor resources and industrial development of small cities and population points.

The inadequate modern level of specialization reduces the technical level of the final product, limits the progress of the functional units of production equipment, impedes progress in concentration of the production of the same kinds of products and thus impedes equipping them with modern, highly productive means of labor, and hampers the introduction of progressive methods of organization of mass production even when manufacturing small-series and single-unit products. The low level of cooperation and the failure to observe time periods for cooperative deliveries constitute one of the most important obstacles to specialization of production and the strongest stimulus for the development of the "natural economy" with all of the losses it engenders. All of these tendencies and their negative consequences are especially important in such a leading branch as machine building. They constitute one of the main



reasons for the unfavorable tendencies in the country's economy. A radical change in the existing situation is one of the central tasks of the foreseeable future and one of the main conditions for advancement along the path of intensification.

The "natural economy" which has taken form in the USSR as a result of the weak development of specialization and cooperation and which is still growing steadily, the most powerful "sectors" of which are mechanical productions and shops in nonmachine-building branches, is a heavy burden on the country's economy because it lowers the technical level of production, it diverts a considerable part of the country's production apparatus and other material resources and lowers the overall level of effectiveness of public production. This leads to an unjustified increase in the resource-intensiveness of production and significantly increases the production apparatus. A lack of confidence in cooperation causes unjustified growth of circulating capital and freezing of many billions of rubles' worth of commodity and material values.

The organization of production within the framework of the enterprise is interconnected in the closest way with the organizational problems at the branch level and (especially with respect to machine building) with problems of specialization and cooperation of production. This pertains to the formation in the structure of each machine-building branch of a specialized production for replacement and repair components and parts of technical equipment, and also components and parts for its modernization. This pertains also to the development in large machine-building centers of interbranch production of semimanufactured products.

In branches of mass production (like the automotive and tractor industry) it is necessary to develop (under the conditions of interplant unification and normalization of components and parts of the technical equipment that is produced) enterprises that specialize in parts and technologies. It is also extremely important to develop a broad spectrum of enterprises that specialize in the production of electronic components and parts. And, of course, it is absolutely necessary to have systematic creation and development of the aforementioned medium-sized and small enterprises with functional specialization for producing functional components, modules and technical equipment for interbranch purposes. It is very important to have consistent formation of machine-building "custom-tailoring shops"--enterprises which on individual orders will produce individual nonstandard technical devices, instruments and so forth. All this, one might say, is the most necessary infrastructure for modern machine building, which will make it possible to consistently limit and reduce the immense machine-building sector of our "natural economy."

One can judge how crucial this is from the following data. As of the end of 1983, of the entire fleet of metal-processing equipment in the country only 41.5 percent was in operation at machine-building plants for producing new products; 16.9 percent was in repair or instrument shops and machine-building plants, and 41.6 percent in machine shops of all branches of the economy except for machine building. The turnover in this latter group was 0.3-0.5 shifts of 2.4-4 hours a day. Thus 58.5 percent of the equipment is outside of basic machine-building production. But even these data do not fully reflect

the scope of the physical economy. In addition to the "first" machine building--machine building plants of machine-building ministries which function in the sphere where in all units (from the plant to the ministry) the art of machine building prevails--and the "third" machine building--mechanics and repair--mechanics shops of nonmachine-building enterprises of all branches of the economy, there is also a "second" machine building--machine-building plants of nonmachine-building ministries which are in spheres that are alien to the art of machine building.

Obviously, such a structure of machine building has little in common with the intensive path of development, it sharply reduces the possibilities of machine building in the area of technical reequipment of the country's production apparatus, and it essentially lowers the technical level and effectiveness of public production and is an obstacle on the path to technical progress.

At the present time at all levels of management and planning, including high levels, there prevails a position of "self-service," the creation of "their own" production of many kinds of machine tools and instruments, supplies and fitting, repair and modernization of equipment "through their own forces" and so forth, including "their own" production of certain polymers. With the existing practice of price setting when the highest and most unjustified actual expenditures are included (that is, legitimized) in the price, any varieties of the national economy will not be reflected in the profitability of the enterprises and associations. One ends up with a paradox: the "natural economy" is not an impediment and it causes harm to nobody except the national economy as a whole. Overcoming this "ideology" and practice should proceed in three directions: raising the level of balance of plans and providing the necessary reserves which guarantee the availability of all kinds of batching products; the development of an economic mechanism for cooperation whereby the products that are delivered late are not counted in on the results of production when calculating bonuses; and changing the practice of price setting and establishing prices that are oriented toward the conditions and the outlays of the specialized production.

#### New Technical Equipment and the Organization of Production: Which Comes First?

We noted above the key role of organizational problems under conditions where there are radical changes in technology and technical equipment. One of these main lines is formed by radical changes in the sphere of automation related to the appearance of equipment with numerical program control, programmed and reprogrammed robots, and flexible automated productions (GAP's). This, one might say, leading complex of scientific and technical progress places a dual kind of requirement on the organization of production.

All of these principally new means of automation can be effectively produced and can be suitable for full-value performance of their functions only when their manufacture is based on the creation of a broad spectrum of enterprises with functional specialization which produce modules, components and parts for this technical equipment.

Effective functioning of these means of automation is possible only in a highly organized environment under conditions that are adequate to the programs placed in the automated equipment when the "hands" of the robots find in the right places the blanks, semimanufactured products, parts and components which they need. The operation of automated equipment under conditions of "indefiniteness" (disorder) requires complicated "sensing" of the automated equipment, equipping them with organs of "vision," "touch" and so forth, which can frequently make them economically ineffective.

What happens in practice? Frequently they begin and develop production of the latest technical equipment without creating the necessary organizational prerequisites. It seems that the practice of producing principally new technical equipment before the structural and organizational conditions are created for its output on a modern level is not justified and sharply reduces the effectiveness of the investments. Apparently, when beginning series production of new technical equipment it is necessary to develop the base at more rapid rates--specialized production of the basic components and modules of this technical equipment. A convincing and extremely costly example of the situation in this area is the production of robots and the incipient production of GAP's. During the 10th Five-Year Plan, according to data of the USSR Central Statistical Administration, 3,965 robots with program control were produced and during 4 years of the 11th Five-Year Plan--33,500. It should be noted that, according to data of the UN, in 1982 the fleet of robots in the United States amounted to 6,250 and in Japan--13,000, that is, during 1981-1984 the USSR produced many more than existed (the entire fleet of robots) in the United States and Japan taken together. Apparently it is necessary to take an interest in the quality and technical level of this technical equipment. These doubts are associated with the following facts: according to the same data of the USSR Central Statistical Administration, during 3.5 years (1981-1983 and the first half of 1984) 26,500 robots were manufactured (a 1.3-fold increase over the plan) and only 14,500 or 55 percent of them were introduced. According to data from reports of the USSR Central Statistical Administration concerning shift work, robotized complexes have sharply increased amounts of down time.

The main reason for such a situation, in our opinion, is that the robots are produced by more than 20 machine-building ministries under the policy of the "natural economy." The preparation of the enterprises for the utilization of the robots is extremely inadequate. Work is not being done at the necessary rates for creating a real culture base for robot construction--a network of productions for producing modules, components, programs and so forth.

This is the path that is to be taken for the "attack" on the GAP's. Before the year 2000 it is intended to do a large amount of costly work for creating GAP's. And again through the efforts of many machine-building ministries, that is, in "farmstead plots." Experience shows that it is not just a matter of the kind of equipment that is produced (even extraordinarily new) but how it is manufactured--primitively or on the basis of well-thought-out functional specialization. In our opinion, it is necessary to persistently repeat that progressive organization of production at enterprises and expedient organization and structure of machine building should precede or accompany the creation and introduction of principally new technical equipment.



Providing a technical level of the equipment that is produced that is adequate from the standpoint of world criteria is extremely closely linked to one more organizational problem: improvement of the current practice of price-setting for means of production. As we know, the consumers of means of production when they receive them, as a rule, "do not trade." The profiles of rolled metal with excess sizes require additional mechanical processing which produces additional shavings are purchased (frequently without registration through the Gosplan) without trading. Machine tools with excess parameters and new models of technical equipment which in terms of their technical level and effectiveness are almost the same as the old ones but whose prices have increased several times more than the real capacity (productivity) has increased (if it has increased) also acquired "without trading."

The reason for this "tolerance" is the system for forming prices. Under the guise of setting them according to expenditures, oriented toward socially necessary expenditures, the actual individual expenditures that are registered are unjustified and are frequently increased. This approach transforms the system of price setting from a stimulus for progress into an "umbrella" for covering up shortcomings. This situation with respect to the prices is linked, of course, to the condition of the economic mechanism. In practice the enterprises are indifferent both to the prices for the acquisition of equipment and to its maintenance, utilization and writing off. This takes place because these processes exert almost no influence on the financial results of the activity of the enterprise or on the wages of its workers.

The practice of price setting that has been described has one more exceptionally important consequence. It creates the appearance of well-being for enterprises that are operating poorly--"anesthesia" which impedes progress. Thus it impedes the disclosure and discovery of ill, weak units.

Shortcomings of the economic mechanism determine the positions and behavior of the producer and the consumer. Last in position but not in significance is the condition of improvement of production and orientation toward the consumer--the nonrefundability of payments of the producer if he does not sufficiently satisfy the demands of the consumer, does not provide the necessary technical level and this is not included in progressively established prices. In terms of importance this is a decisive condition for the progress of public production, its intensification and its effectiveness. Without solving this problem even the most important units of the economic mechanism will operate at half force and will not provide for effective functioning. Poorly operating enterprises should have only one condition for "survival," one "life belt"--radical improvement of their work, intensification and increased effectiveness of production.

In this connection it should be emphasized that a principally important complex of problems still remains unsolved. How can it be that an enterprise continues to be unprofitable with substantiated and justified prices for its products or the consumers reject its products? What organizational and legal forms of influence should be used in such a situation both with respect to the enterprise as a whole and with respect to its managers and collective? A changeover to special conditions for financing, the transfer of the

enterprise to a different administration, its closing and a sale of its capital, and so forth? How does one solve the problem of job placement for the collective under these conditions? This complex of problems, with all of its social and economic significance, requires an immediate solution, and under the conditions of a developed socialist society it undoubtedly can be solved.

Immediate orientation toward solving the problems described above and the realization of the solutions in practice constitute a most important condition for the acceleration of scientific and technical progress and effective investments. Only on this basis is it possible to change the economy over to an authentically intensive path of development.

#### FOOTNOTES

1. It should be stipulated that frequently the growth of the capital availability is determined also by the increased cost of capital. Although the dynamics of fixed capital and hence the capital availability is determined in unchanging prices, a certain influence on these indicators can be exerted in a number of cases by a certain increase in the prices of equipment that does not correspond to the growth of its actual productivity.
2. Lenin, V. I., "Poln. Sobr. Soch." [Complete Collected Works], Vol 36, p 171.

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## FUTURE OF PLANNING, MANAGEMENT DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 58-78

[EKO round-table discussion, materials prepared by L. Belyayeva: "Rights, Restrictions and Prospects"]

[Text] "Life demands a profound restructuring of planning and management, of the entire economic mechanism.... Expansion of the independence and responsibility of the enterprises, active utilization of more flexible forms and methods of management, cost account [khozraschet] and commodity-financial relations, extensive development of the initiative of the masses--herein lies the principal essence of the restructuring," it was said at the June (1985) conference on problems of accelerating scientific and technical progress.

The country is carrying out a broad program for improving the system of management of the national economy. A prominent place in this program is occupied by the economic experiment for expanding the rights of production associations (enterprises) in planning and economic activity and giving them more responsibility for the final results of their work. What problems are being resolved successfully during the course of the experiment and what difficulties still have to be overcome? This was the subject of the EKO round-table discussion in which general directors and deputy general directors of associations for economic problems, workers of ministries and all-union industrial associations, and scholars participated.

Participating in the discussion were:

V. Ye. Astafyev, chief of the planning and economics administration of the Ministry of the Electrical Equipment Industry;

P. G. Bunich, corresponding member of the USSR Academy of Sciences, chief of the problem laboratory of the Academy of the National Economy under the USSR Council of Ministers;



G. A. Yegiazaryan, doctor of economic sciences, chief of the industrial economics faculty of the economics department of Moscow State University imeni M. V. Lomonosov;

Yu. A. Kuzmin, deputy general director for economic problems of the Zvezda Production Association, Leningrad;

S. N. Leonov, deputy chief of the All-Union Production Association for Producing Sources of Light and Technical Electric Lighting Equipment;

I. S. Lobzina, deputy general director for economic problems of the Moskabel Production Association; Yu. U. Mavlyanbekov, head engineer of the All-Union Production Association for Producing Electric Engines;

V. A. Pinga, deputy general director for economic problems of the Kiev Production Association for Relay and Automated Equipment;

Ye. S. Smelov, general director of the Elektrostal'tyazhmash Production Association; P. I. Subbotin, deputy general director for economic problems of the Elektroaggregat Production Association, Kursk;

A. T. Chepelev, deputy general director for economic problems of the Novokramatorskiy Mashinostroitel'nyy Zavod Production Association;

Ye. I. Chuprin, general director of the Podyemnik Production Association, Tashkent; M. M. Shulga, chief of the division for labor and wages of the Zaporozhtransformator Production Association.

The round table meeting was opened by the magazine's editor in chief, Academician A. G. Aganbegyan:

You know what a large amount of attention is being devoted to improving the management of the national economy, adjusting the existing economic mechanism and applying economic methods of management extensively. This work is being done at the present time in the area of preparing for the 27th Party Congress. The higher agencies for management of the country's national economy are engaging in this very seriously. Many scientists and leaders of branches and enterprises have been enlisted. The goal is to enter the 12th Five-Year Plan with an improved economic mechanism. This means that there will have to be essential changes in the style of work of the upper echelon of management, in the system of planning, in the organizational structure of management, and in the system of economic levers, forms of labor organization and incentives for the broad masses of workers.

Briefly, this is a comprehensive improvement of management for which the results of the large-scale economic experiment are very important.

The subject of our round-table discussion is not simply what the experiment is, what it has produced and what it can produce. We must try to extend the customary boundaries and look at what needs to be done in order to actually mobilize the immense possibilities of increasing the effectiveness of public

production. These are possibilities which can be seen at each enterprise. I should like for you to evaluate how large this "step" of the experiment is. At the same time, the limits of any experiment are obvious. We should like to hear what limitations exist, in your opinion, and whether or not it would be better to remove them. Where does one go from here?--is another question that bothers us.

Do you have any questions for me?

[Question] Can one criticize?

A. G. Aganbegyan: One must. Criticism and polemical sharpness always help things if one has convincing facts and arguments, and constructive experience that helps to substantiate the conclusions. Criticism is good when it advances a matter and does not impede it. Please, I ask you to give your opinions.

On the Line of "Supplier-Consumer"

I. S. Lobzina: in the area of planning, in my opinion, a good deal has been done. One can feel the positive changes in everything that pertains to the quality of the development of plans and their intercoordination. The plan no longer "oppresses" us as it did before when the assignments of the enterprise absolutely took no account of its capabilities. It seems that there are prerequisites for effective participation in the planning of the enterprise itself.

EKO: What has changed; after all, the plans are being developed by the same people?

I. S. Lobzina: The attitude of these people and the attitude of the higher organizations have changed. We have felt this since 1983, the year before the beginning of the experiment, in the preparatory work. The VPO and the ministry have begun to take into account more our estimates of our own production capabilities and material resources for the fulfillment of the plan. The process of drawing up the plans now begins earlier and therefore it is possible to balance them and work them out more carefully.

But it is still impossible to change current plans in those where the demands of the consumers of the products change or the enterprise is not provided with some particular material resources. The material and technical support for the plans has not improved appreciably. For example, as before we do not have enough chemical materials or metals. It is not clear what role the Gosplan plays in the experiment that is being conducted.

A. T. Chepelev: I do not agree with Inna Sergeyevna that the experiment has had a favorable influence on production planning. Many problems related, for example, to increasing the role of planning in the preparation for production remain unsolved. The Novokramatorsk Machine-Building Plant has an individual character of production with a lengthy cycle for the manufacture of machines and equipment--such, for example, as hot rolling machine tools or walking excavators. Therefore the period for preparation for putting these into

production is important. For us it is longer than it is at other enterprises of the branch. And we must know a year before the beginning of the planning period what the developed products list is, with an indication of the concrete objects and clients, and it is even better to have a list of the names of the equipment for the five-year plan with a distribution for the various years. Then these lists should not be changed without the agreement of the manufacturing enterprises.

Unfortunately, the new conditions for the delivery of products of heavy machine-building branches and also the provisions concerning cooperative deliveries do not meet the requirements of the economic experiment since the deadlines for submitting orders and applications for cooperation in manufacturing items do not correspond to the cycles for the preparation of production. For example, for heavy crushing and grinding equipment the deadline for submitting orders has been set at 9 months before the beginning of the year (semester) of delivery, which is completely inadequate. The fact is that the capital holder, after receiving the order, submits schedules of allocations to the consumers of the products, after which the latter submit application specifications to the supplier, who should work out the order, coordinate the technical specifications with the consumer or the fund holder, fill out the agreement, resolve disagreements that arise between them and the consumer under the policy established by law, and only after that can he begin to plan and prepare for the production of the given equipment.

Practice shows that all this takes a considerable amount of time, frequently several months. Thus there is not enough time to produce the equipment within the established time periods. An even more complicated situation is created with respect to cooperative deliveries since here the deadlines for submitting orders are not regulated and the client enterprises frequently submit orders and blueprints even during the period for planned delivery instead of submitting them considerably ahead of time. Such a situation leads to unnecessary arbitration disputes, as a result of which emergency situations are created for putting items into production.

EKO: And what is involved in this generally accepted practice?

A. T. Chepelev: All of the orders are issued by the Gosplan for the production plan which is determined by the capacity of the enterprise. And absolutely no time is allotted for dispatching the product. As a result, by the end of the year there remains the carryover residual of prepared products which go into the sales plan for the following year. The amount of this residual will be the amount by which the contractual commitments are not fulfilled. Thus the plan includes ahead of time the failure to fulfill agreements by the amount of the carryover residual of prepared products.

In our opinion, the system by which the Gosplan issues orders for the production plan can be retained. But then it is necessary for the enterprise to develop and establish for itself in the ministry a delivery plan which should be distinguished from the production plan by the amount of the carryover residuals of the prepared product and should take into account the time for delivering unique machines and equipment.



Today time periods for delivery of up to 2 months have been established for our enterprise for individual kinds of products such as excavators, metallurgical and coke equipment, and forge-press machines. But it is not clear what is to be done with the rest of the products on the list which are just as significant and unique as the ones mentioned above. The problem needs a solution.

EKO: Does this affect the satisfaction of the consumers' demands?

A. T. Chepelev: On the line of "supplier-consumer" there are still such organizations as Soyuzglavkomplekty (we have, for instance, Metallurgkomplekt). They fill out agreements for delivery, which only prolongs the process of delivering the necessary equipment to the consumers. These organizations themselves do not conclude agreements; they send the agreement to the consumer with whom it is coordinated and then the agreement is returned to the intermediate organization and only after this does it come to us, the supplier. This system has outlived itself and intermediate stages between suppliers and consumers impede operation.

I. S. Lobzina: I should like to add that the products are dispatched to the territorial material and technical supply bases and they do not guarantee rapid delivery of them to the consumers. Small batches of products sometimes lie around at these bases for several quarters. But here is necessary not to eliminate these bases but to raise their responsibility for delivering products to the consumer to the level of responsibility of the enterprises. It is time for Gosstab organizations not to be intermediaries and not controllers, but reliable partners of the enterprises--both the suppliers and the consumers.

S. N. Leonov: In general the experiment should begin with the USSR Gosstab and a clear determination of its role. When one speaks with the directors of enterprises about the experiment one frequently hears: "Provide us with materials and we shall do everything that has been planned." So far the Gosstab has done nothing to improve its work. From the outside it seems that "cozy" conditions have been created for participants in the experiment, but the material and technical supply remains unsatisfactory. There are still shortages in deliveries and poor quality of the raw material that is delivered. In particular, for us these are products of the chemical industry--press powders and industrial film for lighting. In both cases the quality falls below the best analogs.

Ye. E. Chuprin: Questions of material and technical supply will undoubtedly come to the fore not only during the course of the experiment, but also under the 12th Five-Year Plan. If they are resolved positively now for the limited group of enterprises participating in the experiment it is necessary to think about what will happen when all of them change over to the new system. Will the supply agencies be able to cope with this task? And what will be the real rights of the enterprises?

Before the beginning of the experiment there were a multitude of provisions which prohibited, for example, exchanging metal which an enterprise did not need at a given time and selling unused goods on the side. Have these

prohibitions been abolished since the beginning of the experiment? No. The exchange of this same metal is allowed only through central agencies and only timber can be sold.

#### Why Is the Enterprise Cautious?

G. P. Bunich: An important element of the experiment is providing incentives for difficult plans. To do this the increases in wages and incentive funds are coordinated with the increases in the normative net output (commodity output) and profit (reduction of production costs). But it has become clear that the "difficulty" remains the same. What has stood in the way? Many things. There have not been enough additional materials, capacities or labor resources. It is necessary to have a particular period of time in order to raise the technical level of production and spend the development funds effectively. A number of normatives for incentives for growth are miserly, especially taking into account the weak influence of growth itself on the final indicators, on the overall amounts of the wage fund and on the incentives guaranteed by the "base." Extra incentives for fulfillment of agreements and extra penalties for failure to fulfill them have made the risk unpopular for those interested in reducing the plan. The easier the paths to earnings, the more difficult the plans: at a number of enterprises 50 percent of the material incentive fund is received as a result of increments to prices and an equal amount was provided by above-plan reduction of production costs because of the introduction of new technical equipment for which the incentive was an especially large amount.

The overall reasons for reducing plans have not disappeared either. The fear of the instability of incentive normatives, the need to have free resources for additional assignments, the transfer of people for work in other profiles, the direction of the competition toward formal indicators of the fulfillment of the plan, and so forth. Freedom of activity under these conditions only facilitate the adoption of plans that are not difficult.

The incentive mechanism is more active not for growth, but for the overall level of effectiveness. Since 1985 this has been experienced at VAZ and at the Sumy Machine-Building Production Association imeni N. V. Frunze. There a certain percentage from each ruble of profit, and not just from growth is deducted for the enterprises. As a result the best ones have turned out not to be the ones with poor starting indicators, great unutilized reserves and large increases, but those who have achieved a high level and are maintaining it.

V. Ye. Astafyev: In the USSR Gosplan I have been asked repeatedly: Why do the enterprises not take on difficult planning assignments? Why are the counterplans not difficult? And, naturally, the planners of the Ministry of the Electrical Equipment Industry encourage the production collectives--take on more difficult plans! A fairly large number of enterprises have accepted more difficult plans for productivity, reduction of production expenditures and growth of its volumes. We have approved these plans as state assignments. But essential shortcomings in material and technical supply and in the quality of the plans themselves and the indefiniteness of the situation in which it will be necessary for the experimenting enterprises to work (many of their

partners have not been included in the experiment and therefore their interests do not always coincide) have led to a situation where the manager of the enterprise who has taken on a difficult plan is frequently sorry about this.

There is a contradiction between the evaluation of the work of the experimenting enterprises by the ministries and local planning agencies: to the ministry one reports in terms of normative net output, and to the local planning and party agencies--in terms of the indicator of products sold. This contradiction must be resolved.

Yu. U. Mavlyanbekov: And here is an example of another contradiction. At our enterprises they have planned fairly rigid, taut volume of material resources. No reserves are left for carrying out contractual commitments. Previously it was possible not to fulfill some particular part of the plan according to the agreement, but now this is impossible, that is, there are no conditions for maneuvering material resources. It would be expedient to increase the normatives for material residuals and to remove the more rigid requirements on the utilization of production capacities. The output of a specific list of products requires dynamic changes in the management at the enterprise. It is apparently necessary to simplify the system for introducing capacities, transferring these functions from the Gosplan to the ministry, and also to grant the enterprises the right, within the limits of the established coefficient of the utilization of capacities, to withdraw them when the products list is changed.

Ye. I. Chuprin: Or another example. Directives set the assignments for economizing on materials. But if we have been given the right to economize perhaps it would be better for us to decide for ourselves how best to do this? For otherwise it sometimes becomes absurd: in order to economize on metal we must increase the labor-intensiveness of the manufacture of an item severalfold.

V. Ye. Astafyev: Many branches, associations and enterprises are experimenting in the new economic situation, but it is probably not quite correct to put it that way. From my point of view we are experimental branches, experimental enterprises and it is not we who are experimenting, but the central planning agencies--the Gosplan, the Ministry of Finance, the Gossnab and so forth. I do not see on the part of these central agencies such a desire to actually experiment taking advantage of the experience of our branches and create an effective economic mechanism. The majority of suggestions from enterprises and ministries are put in File 13, and not only are these suggestions not introduced; they are not even considered.

#### And Again About the Quality of the Plans

Ye. S. Smelov: I represent an enterprise which has an almost individual nature of production. Only 6 percent of our products are manufactured repeatedly, and 80 percent of the rest of the products are updated each year. We produce pipe-rolling and pipe-welding equipment whose technical level is fairly high. Up to 20 percent of it goes for exports.



The existing methodological instructions for the experiment pertain to series and mass production. Individual production, which determines technical progress in certain branches, is not taken into account at all. This places in a difficult position such plants of the Ministry of Heavy Machine Building as Novokramatorskiy, Uralmash and the Alma-Ata Heavy Machine-Building Plant which produce complicated equipment.

If the plan were known ahead of time it would be possible to order equipment for it more efficiently (now this is being done more on intuition), having envisioned thereby the necessary technical reequipment. For many years there has been a discussion of the indicators in which this equipment should be measured. In just 1 year our designers reduce the weight of rolling equipment by 2,500 tons (we produce 30,000 tons). But since the output is evaluated in tons, there is no incentive to reduce the weight of the machines that are produced. We have suggested this solution: in the stage of the development of the technical assignment one should establish its planned labor-intensiveness and then establish the wholesale price. This is the system which is in operation in practice. But so far this idea has found no response in the planning agencies. It has long been taught, when determining the physical indicators of the plan to take advantage of units which reflect the main consumer qualities of the products and do not measure equipment in tons. We should like also for machine building, as an area which determines scientific and technical progress in many branches, to be given special attention when the central planning agencies are developing programs for the development of the national economy.

EKO: Our conversation began with the idea that during the course of the experiment planning is still being improved. Now we are beginning to feel the opposite. Is this the case?

Yu. A. Kuzmin: The plan for next year was born with the same pains as in preceding years, but it took even longer to draw it up. The Zvezda Association has not fulfilled the plans for the products list for many five-year plans. The higher planning agencies all have the same approach: the country needs this! This is understandable. But it turns out that the conditions of the experiment are not being observed if this approach remains the same. As a result, the annual plan was unrealistic and was not balanced with the capabilities of production. This happened in spite of the fact that we prepared carefully for drawing up the plan: we calculated the possibilities for each shop, section and machine tool and for each occupation, we developed measures and we prepared a certificate of readiness for the experiment. All this remained on one side, and the plan was on the other.

We hope that there will be changes in the technology of the work of the higher planning agencies and that we will be able to find a reasonable way out.

P. I. Subbotin: I cannot state that with the beginning of the experiment essential changes have taken place in planning. Although the indicators were developed more carefully, the plans themselves were drawn up late. If we are oriented toward volume indicators based on the products list, in the future it will be impossible to scrupulously examine this entire gigantic list at the level of the VPO. Is it really necessary to do this at all? Perhaps it would

be worthwhile to plan only 75 percent of the guaranteed orders and to "stretch" everything else independently, adhering to the criterion of steady growth of labor productivity?...

This, incidentally, will expand the possibilities of utilizing the reserve of capacities for assimilating new products. Moreover practice has shown that there is constantly a need to refine the products list even during the course of implementation of plan for production and delivery and the procedure of this refinement itself is very complicated and confusing. In any event the main thing should be satisfaction of the demands, that is, the agreements and not the plan as such.

V. A. Pinga: Even working under these conditions of the experiment the enterprises still feel pain from the incorrectness and the lack of substantiation of "arbitrary" decisions.

For example, we drew up the plan for the products list, reached an agreement on it with all of the client organizations, coordinated it with the indicators for production activity, submitted the necessary orders for material resources and in April of this year received an order from the ministry: Include in the plan for the year this item (850,000 rubles) to all of our appeals the ministry responded that this is an important item and it is impossible to get rid of it.

After the plan is changed there must be an agreement for the delivery of items, and we not only do not know what this is and we have not ordered anything for it, but also we do not know what to order, where to order it, where it is produced, on what and so forth, and as a result a balanced plan is ruined. And through arbitration, on the basis of the plan the client is forced to conclude an agreement. And the main indicator of the work is deliveries.

V. Ye. Astafyev: It is difficult to establish the same evaluation indicators for each enterprise or even for each subbranch. Probably there should be different approaches for the cable industry, railroad car production and electric locomotive construction.

Take, for instance, such a problem as complete fulfillment of agreements. In Saransk there is the large Svetotekhnika Association and a cable plant. These are two different production collectives and we have set a task for each of them: to fulfill contractual commitments by 100 percent. If they fulfill them the increment will be 15 percent. Of course this is a tidy sum which entices everyone. But their conditions are different. The cable plant, even though it did not have the necessary plastic material, still fulfilled the plan in 1984. Svetotekhnika, for the first time, having exerted immense efforts, fulfilled it by 99 percent. But they were in unequal conditions. The approach should be differentiated. Perhaps if the conditions for fulfillment are easier, it is necessary to set an increment for complete fulfillment not of 15 percent but of 8 percent, and for large collectives with an immense product list and an immense number of consumers perhaps it should be set at 20 percent. Or maybe some other approach is needed, but it should be differentiated.

Yu. A. Kuzmin: Undoubtedly. The failure on the part of our enterprise to fulfill the plan for the products list by 3-4 million rubles ends up being an underfulfillment of the plan by the clients of hundreds of millions of rubles. And the reasons for our problems are mainly the high proportion of outdated equipment, 41 percent of which is more than 20 years old. We have equipment from 1931, 1937 and 1939. We have long been trying to obtain funds for technical reequipment, but only now, it seems, we are beginning to receive some.

Yu. Yu. Mavlyanbekov: The Gosplan plans in terms of the products list for the national economy. The Gossnab sharply increases this products list. It increases even more at the enterprises when they change over to agreements. Here is what happens: one line in the Gosplan means approximately 70 lines in the Gossnab and 70,000 lines at the enterprise. Of course in this situation it is difficult to plan precisely the material and technical supply for the plan, that is, to balance it. As a result, we change over to average weighted norms and end up with a lack of coordination. The average weighted norms are considered by the ministry and coordinated with the Gosplan while the extended products list (from which these norms are planned) is determined by the Gossnab. The latter remains to the side. And the enterprise must go through this triangle--Gosplan, Gossnab, ministry--in search of a solution to the problem of how to balance the plan in terms of the volume of metal, for example. Apparently it would be expedient to redistribute certain functions between the Gosplan and the Gossnab. The latter, when planning the extended products list, should be concerned about the allotment of metal as well.

#### Wages, Profit, Incentives

P. G. Bunich: Among the examples of inertia one should include the application of individual normatives for increasing wages instead of the unified ones that have been envisioned. The individualization of these has been adapted to proportions that existed in the past and has changed nothing in incentives. The inertia has also been compulsory. Not seeing the proper difficulty of the plans from below, the ministries have increased them. They have also sent down additional assignments. They have also had to produce superfluous indicators in order to observe the statistical and other reports and still keep up with the rest. Inertia from above was reinforced by inertia from below. In order not to aggravate the customary relations with passive workers, the incentives for the active ones were too modest. All the remaining "ceilings and limits" also had a retarding influence when people worked up to them and then stopped. In particular there was a limit on the expenditure of savings on wages when there was sufficient above-plan profit left for local disposal. The normative established for this was frequently too small.

G. A. Yegiazaryan: The large-scale economic experiment should be based on long-term, particularly five-year, plans. This is explained by the fact that a system of long-term normatives which are guaranteed for the enterprise and provide for its long-range economic interest can be created only on the basis of five-year plans. Up to this point we have not managed to make them stable.



If the five-year plan is to lie at the basis of the economic mechanism, in this case the 12th Five-Year Plan, it is necessary to have a clear idea of the demands it should meet (flexibility, balance, stability, reduction of the number of indicators) and one should strive to keep these requirements.

We should discuss the role in planning of one of the most important indicators--profit has ceased to be an indicator for evaluating the work of the enterprises. In the process of the experiment it was suggested that its role be increased, changing over to the normative-shared method of its distribution. But what happened? The normative-shared method essentially does not exist in the five-year plan and the financial aspect failed. In a certain sense we took a step backward as compared to the decree of the CPSU Central Committee and the USSR Council of Ministers of 12 July 1979 concerning improvement of the economic mechanism, which clearly recognized the need for the development of financial indicators within the framework of the five-year plan. Now the framework for the normative-shared method of distribution of profit is the annual plan. But still this method should be based, and herein lies its peculiarity, on long-term stable normatives for distribution. Its utilization within the framework of the annual plan means a weakening of the stimulating role of profit.

I do not think that we took a large step forward when we rejected indicators of labor productivity, profit and the proportion of products in the highest quality category as fund-forming indicators and replace them with the main indicator here--production cost. Production cost is not a very mobile indicator. By linking the material incentive fund to it it is as though we stabilized this fund. It is apparently necessary to continue to search for and find a place for labor productivity in the new fund-forming system.

We have essentially linked the movement of the wage fund to the normative net output. But what has happened? On the one hand, there has been an increase in the role of the indicator of deliveries under agreement since we regulate the material incentive fund depending on the fulfillment of this indicator. On the other hand the wage fund has nothing to do with deliveries and does not experience pressure from this indicator.

I. S. Lobzina: I do not agree with Gevork Ashotovich. It is correct that under the conditions of the experiment the enterprises have been given the right to establish the numerator and denominator from the standpoint of planning the wage fund, that is, the number of personnel and the volume of production. In no case should the wage fund be linked to deliveries because there are still many unsolved problems here. There is no feedback in the system of "enterprise--Gosplan--Gosbank--Stroybank." A good deal here does not depend on the enterprise.

G. A. Yeyezaryan: I am not calling for having the movement of the wage fund be strictly tied to the fulfillment of the delivery plan. But one must think about how to link it to indicators of effectiveness, for example, labor productivity. A mechanical attachment of the wage fund to the normative and output is questionable.

P. I. Subbotin: I should like to say something about the new policy for forming the wage fund. While previously we worked according to wage normatives per 1 ruble of normative net output, we are now oriented toward the increase method: for an increase in the normative net output we receive an increase in the wage fund. But a mathematic evaluation of the analytical expression of this dependency or, as it were, an investigation of the area of values shows that by achieving low directive growth rates for labor productivity the enterprises have the opportunity to form the wage fund in a way that satisfies them by increasing the volume of production through extensive means. In my opinion, there remains the problem of the requirement for stability of the growth rates of the production volume. Apparently there are "conditions of saturation," the natural explanation for which can be the optimal size of the enterprise and other factors. Thus there is still some doubt that the method will withstand the test of time.

G. A. Yegiazaryan: The largest number of problems has accumulated in the system of incentives, and so far the experiment is not solving these problems. It is apparently necessary for the system to work on a plus and minus basis. If we have the opportunity to increase the salary of the engineering and technical worker up to 50 percent this will be an achievement.

I. S. Lobzina: Now the normative for deductions into the material incentive fund for reducing production costs is set in the amount of only 5 percent. For material-intensive enterprises for the cost of materials is determined by the physical qualities of the metals (as, say, in our cable industry), the reduction of these production costs, as a rule, does not exceed 0.3-0.5 percent. And  $0.5 \times 5 = 2.5$  percent of the material incentive fund. As we have calculated it this means 5 rubles 40 kopecks per person per year which, of course, is extremely little. If there were two fund-forming indicators then possibly as a result of the latter--labor productivity--we could increase the amounts of this fund and the effect from material incentives would be greater. It is also worth thinking about raising the amounts of the normatives of deductions into the material incentive funds themselves, depending on the reduction of production costs and the growth of labor productivity.

The amounts of the fund for social and cultural measures and housing construction are extremely insignificant--36 percent of the material incentive fund. Such a volume does not contribute to increasing the role of the labor collectives. In order to construct a residential building, for example, using this fund it is necessary to save money for 7-8 years. This is conditioned by the fact that the basis (material incentive fund) on which the fund for social and cultural measures and housing construction is calculated is too small.

M. M. Shulga: As concerns the normatives for the formation of the economic incentive funds, I fully agree with Inna Sergeyevna that they are extremely low. The material incentive fund is additionally adjusted depending on the volume of output of consumer goods. But one must take into account that at one enterprise they will produce 10 kopecks' worth of these goods per 1 ruble of wages, and at another, like ours, for example, 1 ruble 87 kopecks. And the normative for the formation of the material incentive fund according to this indicator is the same for everyone. Probably this policy too needs to be revised.

EKO: Apparently there should be greater opportunities for incentives within the enterprise as well?

A. T. Chepelev: It is necessary to grant greater rights to the manager in questions of material incentives for engineering and technical personnel, employees and auxiliary workers. As long as the bonus provisions are linked to the main indicators of the activity his hands are tied. On the basis of concrete conditions (and they differ at all enterprise) the manager should act as he considers correct, and he can solve these problems himself.

Ye. I. Chuprin: The question of bonuses for management workers has not been resolved. The initial amount for determining the amount of bonuses for general directors is their salary not including personal increments, and for the rest of the management workers (head engineer, deputy director and so forth) the bonus is calculated on the salary and the increment for high qualifications. As a result, the earnings of the general director turn out to be less than those of his deputies. In my opinion this is illogical.

V. A. Pinga: I wish to touch on an issue that is perhaps not the major one but is still important for everyone concerning the rights of the enterprise to establish the number of administrative and management personnel (AUP). So far the management of the enterprise has no rights regarding this. The number of AUP is established from above as is also the annual assignment for reducing this number. Under the conditions of the expansion of rights in all other areas of activity the provisions concerning the AUP look like an anachronism. It is no secret that many workers of the management staff and engineering and technical personnel (electronics experts, programmers) who are necessary to the enterprise have to be called "technologists" and so forth in order to find a way out of the situation. In our opinion, the enterprise should be granted the right to resolve independently the issue of the number of production and administrative-management personnel within the limits of the overall number of workers, to refrain from establishing annual assignments for reducing the number of AUP, and to refine the list of workers who are included among the AUP. If we were to carry out these assignments the position of "general director" would no longer exist.

I. F. Lobzina: We have developed our own bonus divisions. But a comrade came from the State Committee for Labor and Social Problems and said that we did not have the right to do this.

V. A. Pinga: Exactly. With respect to many concrete issues we have actually been given no rights.

P. G. Bunich: We are saying that it is necessary to expand the rights. That which the enterprises themselves have halted should also be brought to completion. We are speaking about arrears in reconstruction of internal cost accounting from external. Everything has been reduced to the fact that the assignments for the brigades are linked to the fulfillment of agreements. This is clearly inadequate. The workers do not have a sense of the experiment: it hangs high above them and has not reached the brigades and the work positions.



## A Brief Summary

The results of the work of the enterprises whose managers participated in our round table discussion in 1984 were positive: the fulfillment of contractual commitments improved, plans were fulfilled for volumes of production and growth of labor productivity, and issues related to increasing the effectiveness of production and raising the technical level of the products that are produced are being resolved more energetically.

At the same time there has been no marked improvement in the style of work of the staff of the ministries that are conducting the experiment, and especially the staff of the VPO. Productions associations (enterprises) are not strongly involved in the development of five-year and annual plans. The possibilities of improving intraplant planning, cost accounting and material incentives are being utilized poorly. During the course of the experiment there has been a certain limitation of the rights of the enterprises to develop bonus systems.

Generalizing the statements of the participants in the round table discussion, one can point out the following necessary measures.

To increase the role of the five-year plan and its stability. The volume indicators of the main kinds of products in the five-year plan should be provided with adequate limits for material and technical resources in the annual plans.

To transfer production associations to the USSR Gosplan for direct long-term ties for the delivery of materials, metal products, timber materials and batching items.

To grant the enterprises the right to establish independently the number of AUP within the limits of the overall number of workers. To refrain from setting annual assignments for reducing the number of AUP.

To permit enterprises to create a reserve from the unused part of the wage fund.

To establish qualifications for engineers for several classes, increasing their salaries. The minimum salary should be no less than the wage of a worker of the fifth category.

To increase the normatives for deductions into economic incentive funds from the reduction of the production cost and the growth of labor productivity.

To extend the experiment being conducted in enterprises of the Ministry of the Electrical Equipment Industry for forming a unified material incentive fund to other ministries.

To increase the amounts of sums used for bonuses.

To differentiate the amounts of bonuses of divisions and services of the associations, depending on their concrete contribution to increasing the effectiveness of production.

To step up the work of the central management agencies, the ministries and the departments for providing conditions for complete realization of the principles of the experiment, for a rapid solution to the problems that arise during the course of it and for extension of the experiment to all branches of the national economy.

At the April (1985) Plenum of the CPSU Central Committee it was noted that "the results of the large-scale experiment that is being conducted are certainly not bad. But they cannot satisfy us completely. We have reached a level where the experiment must move on to the creation of an integrated system of management and control.

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## PROGRESS OF ECONOMIC EXPERIMENT RELATED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 79-88

[Article by S. N. Zhelevko, B. V. Sazonov and A. Ye. Cherikova (Moscow): "Changes During the Course of Changes"]

[Text] Research on the process of implementing the economic experiment (EE) at enterprises of Moscow which was conducted by the authors of the article during 1984 showed the existence of certain stages in it. What are they, to what extent are they necessary, do they coincide for enterprises of various branches, do they remain the same as more and more new branches are included in the experiment? The answers to such questions, it seems, require immediate study since subsequent of the experiment will depend largely on this.

### Experiment or Reform?

First of all it is necessary to distinguish the modern experimentation from the preceding practice of large-scale reforms, since the principle of having stages is embedded in this.

The economic reform presupposes a relatively integrated, internally noncontradictory and complete set of measures which come into force for all areas of economic activity, require unwavering execution and are not subject to revision for a certain amount of time in the foreseeable future. The time of changeover from prereform to postreform conditions should be minimal and movement in "short steps" is perceived as undesirable even if it is inevitable.

The experiment, on the contrary, presupposes testing proposals that have been made (which, moreover, might not be all-embracing and are tested using individual examples and all-around criticism of a particular experience for its operational changes. Various experiments can take place in various places, including those which contradict one another.<sup>1</sup> The stages here mean, above all, the possibility after completing the first cycle of experimental testing to change the conditions and begin a new cycle or to completely halt the given direction of experimentation, replacing it with another.



All these are things which distinguish an experiment from a reform. Let us take a look at the practice of the economic experiment in this regard.

First of all let us take note of the "principal innovation" of the conditions of the EE. Actually all of them in one form or another (perhaps with the exception of the idea of the priority of the fulfillment of the plan for deliveries under agreements) were contained in the economic literature which appeared in the wake of the economic reform of 1965.<sup>2</sup>

Is this good or bad? Opposing opinions are expressed, but we shall regard this fact as positive: the provisions of the experiment are based on serious theoretical development and were brought forth previously, but they did not make their way because their implementation and testing meant under the conditions of the "reform" approach the development of a new complete and noncontradictory set of provisions which entailed costly restructuring of the entire national economy. Today many ideas of preceding periods of development of economic thought have been given the opportunity of empirical testing. Moreover it is precisely in the experiment that it is possible to test norms of management which before the reform were considered too risky and went beyond the framework of the obvious.

In 1984 the experiment was tested in the activity of five branches and at individual enterprises of a number of other branches. There is always the legitimate doubt: Will the partial results that were obtained not take a different form when the experiment is extended everywhere? Thus, for example, people assert that the advantage in material and technical supply which enterprises included in the experiment have will be lost under general conditions and it is precisely the shortcomings in this supply that will frustrate all expectations. But workers of the USSR Gosplan, the initiators of the EE, give this counterargument: when all services are changed over, including Gosplan services, to work conditions which are experimental today the quality of material and technical supply will also improve and, consequently, this priority is nothing other than the observance of the pure points of the EE.

Incidentally, this purity is not always maintained. A dual system of reporting was retained for enterprises participating in the EE (they reported to territorial management agencies that summed up the results of socialist competition according to the old system). In places where not all enterprises of the branch were participating in the EE they selected the best ones which, naturally, does not contribute to obtaining fully valid comparable results.

Consequently, the question of the purity of the EE has two levels. The first is the principal possibility within the boundaries of a particular organization of the experiment to obtain generally significant data. Here we are speaking about the methodology of experimentation. The second level is methodological purity, which is quite possible with a certain amount of persistence on the part of the leadership of the EE.

As was noted, experimentation presupposes developed and comprehensive criticism which relies on an analysis of the course of the experiment. Criticism of the EE has been extensively presented on the pages of the mass

and more specialized press. As concerns scientific analysis, it has an efficient organizational base and it is being conducted through the forces of many leading scientific institutions of the country.

Let us note simply that the criticism (so far) has not been raised to the level of general theoretical models. Possibly this is related to the short amount of time of the EE itself (although theoretical discussion of economists ran practically parallel to the reform of 1965) and also the last innovation (or theory) of the conditions of the EE. But still the lack of this layer of criticism can be regarded as a shortcoming since the multifaceted nature of experiments and also the diversity of directions for development of the EE itself require regular testing and the formulation for an overall strategy for economic experimentation. Within the framework of such a strategy tasks can also be set for fundamental economic and social research which go beyond the framework of the express analysis which is being done today by scientific organizations participating as observers of the EE.

### The Experiment Goes In Depth

An important feature in the implementation of the EE is the fact that with unchanged external conditions of the experiment one can observe its temporal development as it penetrates into the depths of the enterprises (associations) and this causes an intensive wave of secondary experimentation with respect to various subdivisions of the enterprises. If the first subject of the experimentation was the USSR Gosplan, the second wave is being directed by the management of enterprises as a whole and their functional services in particular.

Strange as it may be, the basis for this "independence" was the poor level of development of all the details of the EE (which apparently was included in the task of its organizers). Therefore the enterprises have adapted it to their own situations and problems. Thus, for example, one can distinguish methods of material incentives; the subdivisions are encouraged either simultaneously in keeping with three basic indicators that lie at the basis of the formation of material incentive funds or depending on which of these indicators exerts the most actual influence on the given subdivision. The initial units of the enterprise for which these indicators are calculated can be divided up in various ways; in some cases then they can be shops and in others--brigades if the enterprise has a nonshop structure.

In general the EE has been a stimulus for the development of brigade forms of labor since the brigade is apparently the most adequate unit for consolidating accounts and evaluating new planning indicators. The system of increments to salaries varies quite significantly (substantiation, duration of increment, system of control over the performance of duties). The range of people permitted to conduct experimentation within the official range of duties also varies.

Let us take note of the fact that is essential from our point of view. All of those who were granted the right to their own experimentation within the enterprise (this pertains mainly, of course, to the economic services of the enterprise and primarily the deputy directors for economics (sharply increased

the volume and quality of their work, frequently without any material compensation, and nonetheless they express a sense of dissatisfaction with the situation that has taken form. From the realistic standpoint the fact is fairly obvious: creative disclosure of professional capabilities is one of the central stimuli for labor and for its positive evaluation on the part of the workers.

Of course the possibility of experimenting was rated positively only by those who had sufficiently high qualifications. Otherwise the need for this was perceived cautiously and this attitude extends to the EE as a whole.

But one way or another the development of their own "internal" experiment for the enterprise acquire their own rhythm of movement and approval of ideas, and these rhythms can fail to coincide for various enterprises, the more so since the forms of experimentation vary.

The stages of the EE are also manifested in the fact that today it has reached various production levels to varying degrees if one keeps in mind individual material incentive, and not all incentive funds are equally effective.

With respect to individual incentives the EE affected mainly engineering and technical personnel--both in the form of increments to salaries and in the form of bonuses; it extended to a lesser degree to workers.<sup>3</sup> This was caused by several factors. First, even before the EE the workers were steadily receiving bonuses regardless of the degree of fulfillment of the indicators that are now taking into account. Therefore improvement of the work from the standpoint of these indicators affected mainly engineering and technical personnel who were previously frequently deprived of bonuses for failure to meet these indicators. In the second place, the possibility of relatively free distribution of the growing fund for individual material incentives is most frequently used to eliminate existing disproportions in the payment of various categories of workers: whether it be engineering and technical personnel as compared to workers or machine-tool operators as compared to workers on conveyors.

Obviously, this approach to the distribution of the bonus fund is a temporary and fairly specific stage. After the elimination of these disproportions (say, through the establishment of new wage rates) the bonuses can be used for the direct purposes--for encouraging people who have achieved the best results in labor, regardless of the category of personnel to which they belong.

Let us note also that it is important to know about such stages in the implementation of the EE and to promptly inform all participants of them. Today one frequently gets the incorrect opinion that the EE means an immediate increase in bonuses for each and every one--with the fulfillment of the conditions of the experiment. False hopes cause the positive attitude toward the EE to change into a cautious one if not a negative one, and this change is not affected by considerations which seem rational and convincing to the outside observer: "Even if I did not receive anything extra, the work of other sections and services was paid for more fairly" (again a well-known sociological fact).



As for the fund for social and cultural measures and housing construction, so far its influence is not essential: during the time of the EE it has not managed to increase appreciably, and its provision with resources has not improved (which, incidentally, stands in contradiction to the conditions of the EE).

It is constantly being noted that the EE has "not reached" the ministries, which are not contributing actively enough to its success. Suggestions made in connection with this can most frequently be reduced to the idea of linking the payment of ministry workers to the fulfillment of the same indicators to which the enterprises are directed. While agreeing with this, we still consider this to be a half-measure. Our analysis shows that the greatest effort is given in a situation when the worker has a greater field of activity for creative work, in this case--experimental. The ministries must be given their rights and responsibilities in the EE, their own field of experimentation; and the broader the range of figures that would be in effect in it, the more productive the result will be.

#### Have the Goals Declared in the Experiment Been Reached?

The EE as a whole has already gone through a certain stage in the sense that it is possible to evaluate the degree to which the goals set by the experimenters have been achieved or in principle can be achieved because of it.

The obvious result that corresponds to the intention is the considerable reduction of the underfulfillment of the plan for deliveries under agreements. Here it is also obvious that this growth is achieved both as a result of a conscientious increase in labor discipline (oriented toward the corresponding system of incentives) and as the result of planned organization of restructuring of the work of many services in the enterprises.

Additional possibilities have appeared for paying for good and very good labor (especially to those categories of workers who were deprived of this in recent years).

Many subdivisions have become more active in improving various aspects of the activity of the enterprises.

Nonetheless certain goals have been achieved only to a small degree.

The EE presupposed a sharp increase in the independence of enterprises in planning their lists of items, but this did not take place. As a rule, even under the conditions of the EE the enterprises cannot avoid the production of outdated products which are not very interesting to them (either economically or technically) since the demand for them exists and to remove them from production means to halt the production for the traditional consumers of the given product.<sup>4</sup> Therefore the ministries are forced to control the output of the broadest list of items regardless of what the basic planned products list may be. In other words, the enterprises are obligated to conclude agreements with certain consumers for a particular list of products.

The development of the EE should apparently proceed in the direction in which the ministries will not be motivated to take orders from other ministries (in the case of interministry deliveries) if the items that are ordered are below a certain technical level. Other suggestions are also possible (one of which we shall consider below).

The EE grants enterprises the right to vary the number of personnel with a wage fund which is determined according to a normative, making it possible, in particular, to increase the wages of the workers as a result of reducing the overall number of them with the same volumes of output. But in practice the desired reduction of the number of workers (taking into account a subsequent elimination of the shortage of the labor force) is not taking place because of several reasons. The first is the lack of confidence in the long-range maintenance of experimental conditions and the fear that after the actual number of workers is reduced the wage fund will be brought into line with the existing personnel according to the actual normatives for the average wages. And this can lead to increased intensiveness of labor without compensating for it in payment. The second is the desire and even the need to maintain excess personnel for emergency work and for taking personnel away for outside assignments (we recall the conclusion of the Shchekino workers regarding this). An interesting detail from the sociological standpoint: surplus labor force in the shop (especially if it is marked by certain offenses) is a means of increasing controllability when distributing work, wages, time periods for performance and so forth.

But still even with these impeding factors certain positive results are in evidence: the enterprises are no longer asking for more labor force and are providing for the increase in output with what they have.

Probably, as the confidence in the stability of the new "rules of the game" becomes stronger one can also expect a certain reduction of the number of personnel, especially if additional methods contribute to this.

The EE has provided for a certain increase in funds left at the disposal of the enterprises that go for technical reequipment (simple or even expanded reproduction in terms of certain parameters). But it is always recognized that the funds that are allotted, as usual, are not sufficient even for simple reproduction. In principle, the latter problem can be solved even with the framework of the given EE. But if in practice there arises the question of the possibility of expanded reproduction at the level of the enterprises, the determination of the funds for this and of how the enterprises can utilize them competently and effectively enough is extremely complicated; the answer requires the creation of new experimental situations. But in the near future one can hardly expect a transfer of fairly serious functions of control of reproduction processes from the centralized level (superministry and ministry) to the lower levels.

It was assumed that the EE would be an additional stimulus for intensification of production processes and in particular for increasing the number of productive technological innovations. Such measures as encouraging the output of new products and products for export, and financial sanctions for the output of outdated products were directed primarily toward this.

But the innovative upsurge has not been in evidence, which is explained by fairly obvious factors. First of all the basic efforts of the EE have been directed toward observance of time periods for deliveries under agreements within the limits of the ordered list of products. Updating the products list is frequently impeded by the specific interests of the consumer (when the products that are received act as batching items he can come out against innovation if it forces him to restructure the output of its own products outside the plan) and the lack of interest of the supplier: the consumer is determined for him ahead of time and under conditions where there is only supplier and a shortage of products the consumer will take whatever he is offered. In addition to this main reason, another impeding factor is that the plan for the output of new products can be fulfilled formally just as well with extremely varied practical results and efforts expended on this. Frequently a new combination of already known elements is put off as a qualitatively new item. A facile approach to new things can also be maintained by liberal criteria for innovation. Thus, for example, the definition of what is new accepted in the Ministry of the Electrical Equipment Industry as that which is just as good as or even surpasses existing domestic and foreign models in fact is not very innovative since the newness does not lie in the mass products, but in patents and designs for new items. Especially doubtful is the predicted economic effectiveness of innovations which, as a rule, rarely exceeds the actual amount.

It is necessary to keep in mind that control of innovation processes mainly through direct incentives for them generally turns out to be extremely problematic. In this respect the experience of Hungarian industry is instructive. It works under the conditions of an experiment which is directed largely toward intensification. In Hungary they encouraged the enterprise in all ways to enter the international market, which under the conditions of increasing competition is impossible without constantly updating products and technologies. But the innovation activity does not justify the expectations since many Hungarian firms, especially large ones and those who have monopolistic influence on the domestic market, prefer to count on financial assistance from the state rather than to take risks on the foreign market. Hence it is obvious that experimentation in this area in our country should go through a whole number of steps before the measures intended for intensification assume the proper influence.

#### How Should the Experiment Develop?

In order to understand the specific features of the EE it is very important to know how its initial premises change.<sup>5</sup>

From the standpoint of a natural scientific experiment this is prohibited device, one of the most serious violations of its methodology. But for social experimentation such a provision must be recognized as normal (and, we might add, it is necessary to develop the corresponding methodology for the experiment where this is permitted). Using the example of the EE it is easy to demonstrate the correctness of the violation of norms for natural scientific experiments. Initially the organizer of the EE was the USSR Gosplan, which also developed its provisions. But the importance of the



measures turned out to be so great and the range of people directly affected by it turned out to be so broad that the directive agencies could not but form a broad and representative commission whose competence included both research and development of the EE (it included representatives of academic circles and the branches). It is not out of place to note that these representatives could have their own plans being realized and directions of experimentation and a special attitude is formed toward the EE which is already in progress and the possible modifications of it.

The possibility of modifying the EE before the first system of proposals (advanced by the USSR Gosplan) is tested is actually becoming a reality. A fairly large number of frequently radical suggestions have been made, not only for continuing the EE, but also for essentially augmenting it and even going against the initial ideas (the methodologically developed proposal to evaluate the work of the enterprise according to the net output and not the normative net output which was advanced by the institute of economics of the USSR Academy of Sciences).

Without going into the essence of the proposals that have been made, let us discuss the methodological aspect of the problem of experimentation. And so a change in the conditions of the experiment in any stage should be recognized as normal. But what then is tested and how is this done?

It is obvious that the investigation of the course of the experiment, which is already in progress at enterprises with certain preliminarily given conditions, is necessary and useful, but it cannot be the only kind of investigation: new forces have intervened in the experiment, it has assumed new directions and from the standpoint of the preceding analysis this means a great deal. In general the researcher ends up always late since he is analyzing that which has been suggested and not that which people intend to suggest. The only time the research is not late is when he is working in close contact with the planner of the experiment or in it.

Concretely, this can take place in the following forms. The researcher gathers all proposals for the development of the experiment (including those which he knows will be accepted in the near future) and groups them from the standpoint of proximity (in terms of mechanisms, consequences and so forth). The grouping is done with the help of expert evaluations.

In the next stage there is an expert evaluation of the possible consequences of one block of experimental proposals or another. The completeness of the expert evaluations and the quality of their organization are essential here.

The most developed form of imitation modeling of the proposed experimental variants is the organizational activity game<sup>6</sup> in which real representatives of real organization affected by the experiment participate. And during the course of this it turns out to be possible not only to discover its consequences, but also to transform the set conditions of the experiment and adapt it to the environment.

#### FOOTNOTES

1. In 1984 about 40 economic experiments were being conducted in the country at the same time.
2. For comparison it is sufficient to be familiar with the work of Ya. A. Kronrod "Zakon stoimosti i sotsialisticheskaya ekonomika" [The Law of Value in the Socialist Economy], Moscow, Nauka, 1970.
3. We shall give figures for seven Moscow enterprises we investigated (of the 29 participating in the EE). As follows from L. Voronin's article, "The Economic Experiment--The First Results on the Path of Development" published in No 12 of PLANOVOYE KHOZYAYSTVO for 1984, the unionwide indicators are of a different nature. Nonetheless the figures we obtained are typical of a sufficiently large number of enterprises and, consequently, this gives substantiation to the discussion of these figures.
4. The fact that this is not such a simple problem is written about in an interesting article "Stress on the Stairway" by A. Nikitin (PRAVDA, 10 January 1985). This is about when the Perm Electrical Equipment Plant removed from production engines for the Malyutka washing machine which had been in great demand for many years.
5. We have in mind not the sequence of experiments where such a change is predictable, but changes in time within a period that is not yet over that is determined for the given experiment.
6. See a description of this in the article by G. P. Shedrovitskiy in the book "Novovvedeniye v organizatsiyakh" [Innovations in Organizations], Moscow, VNIISI, 1983.

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#### FURTHER RESULTS OF ECONOMIC EXPERIMENT DESCRIBED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 89-106

[Article by G. A. Kulagin (Leningrad): "Products List, Price, Profit"--a discussion]

[Text] At the present time on the pages of the central newspapers and in the economics journals there is discussion of the preliminary results of the large-scale experiment. At the same time, since 1985 the range of enterprises changed over to the new conditions has expanded significantly.

The following desires clearly prevail in the statements of the production workers participating in the first stage of the experiment: to decisively reduce the number of planning and evaluation indicators (which, incidentally, amount to many more than was envisioned by the economic reform of 1965); to radically improve supply, and also to enlarge the agreement for the delivery of products which, in our opinion, is the reverse side of the same problem of increasing the reliability of supply.

Economists, having agreed to these wishes, are engaging a lively discussion of another subject: precisely which indicators--physical or value-- should be given priority and what should be the concrete set of these indicators? Extremely interesting in this respect are the articles by the eminent economists A. M. Birman, "Tons, Units, Rubles" and D. B. Valovoy, "Specialization and Sales" which were published in EKO as a discussion.

The enthusiasm in the first article is directed against the "passion" for physical indicators. Its author points out the utopian nature of the idea of direct calculation, even with the most modern computer equipment, of the physical needs of our gigantic national economy and protests against attempts to create artificial generalizing indicators that are based on an arbitrary "ranking" of various kinds of components, and he places the role of value categories in the foreground.

The author of the second article, D. V. Volovoy, conversely, giving extremely eloquent examples of the fictional growing gross general effect and the carrying out through manipulations of cooperation which nobody needs, while not denying a certain significance to value categories, thinks that in the



system of planning indicators the main position should be held by physical and labor indicators, and the position of the indicator of the gross output should be held by the normative net output (NChP).

Although at first glance the two concepts seem directly contradictory, paradoxical as it may be, it seems that in the criticism of the existing system of indicators both authors are right. As for their suggestions for improving planning and evaluating the work of the enterprises, while differing essentially from one another they are also fairly convincing, although they are less clearly formulated.

As a practical worker who has worked for more than 40 years at industrial enterprises it seems to me that there is a possibility and, the main thing, a necessity to reconcile these two different approaches and to find a synthesis which will help to utilize more fully the immense reserves of our production collectives.

To begin with I should like to support the opinion that it is impossible to underestimate the role of economic methods of managing the economy. Figuratively speaking, the economy of developed socialism rests on three pillars: state public ownership of the means of production, centralized planning and commodity-monetary relations. It is precisely in the combination and full utilization of all three of these foundations that one sees the advantages of the socialist means of production. We cannot ignore the laws of the actually existing commodity and monetary relations. Moreover, without utilizing them correctly it is impossible to measure either the labor contribution of each worker, that is, to realize the main principle of socialism--"to each according to his labor"--or to determine the effectiveness of the work of production collectives. This is a generally recognized axiom.

But D. V. Volovoy is also right when he blames the existing value indicators, particularly sales, which is nothing other than the "alter ego" of the notorious "gross" in many of its faults: in the impoverishment of the assortment of consumer goods, in the disappearance of many necessary but inexpensive items in the drive for "others' labor," in the growth of material intensiveness and the decline of the output-capital ratio and, in the final analysis, in the reduction of the real effectiveness of public production.

As was already said, both authors recognize the need for "coexistence" of physical and value indicators. Neither one of them denies the need for planning the products list or the usefulness of increasing the responsibility of the enterprises for the fulfillment of agreements for the delivery of products, for without this it is impossible to have normal operation either of individual enterprises or of the national economy as a whole. The only dispute is about the degree of detailization of "physical planning" at various levels of management of the economy.

But their basic difference consists in their answers to two questions. First: How does one evaluate the dynamics of the changes in the volume of products that are produced for "physical terms" are not suitable for this or, more precisely, for the majority of our multiprofile enterprises it is clearly

unsuitable? And second: How does one evaluate the final effectiveness of production.

A. M. Birman thinks that to do this the most suitable indicators are those of sales and profit, which actually are reflected in the bookkeeping balances and in bank accounts, and he objects to constructing artificial indicators like the NChP.

His opponent, conversely, considers the NChP to be the most suitable measure of the dynamics of the products that are produced since when it is "constructed" correctly this indicator reflects more precisely the actual contribution of the collective to the social product and eliminates the drive to "enlist" "outside" labor and to give only the appearance of increasing the production volumes. In order to evaluate the effectiveness of production a system of various kinds of indicators is suggested, among which profit is not mentioned.

And both authors avoid or say very little about what in our opinion is the main question: prices and price setting. Yet under the conditions of a planned economy when market relations do not serve as a regulator of prices, correct price setting, it seems to us, is a radical issue for further improvement of the economic mechanism. Not to mention the fact that all distribution relations rest on prices, all currently existing planning and evaluation indicators are derived from the price: sales--is the sum of prices of sold goods, the NChP--is also this sum minus "past labor," profit--is the price minus production cost, productivity--is the sum of prices of products divided by the number of industrial personnel, and so forth.

Before discussing the role of prices and price setting in detail it would be useful, in our opinion, to turn to the experience of the 1965 economic reform which placed the profit indicator in one of the leading positions. Today one frequently has occasion to read articles that criticize this indicator. The basis for the criticism is the fact that the 1965 reform did not produce the expected effect. Yet it was precisely during the course of the reform that the gross rates of labor productivity increase significantly, indicators of the utilization of fixed and circulating capital improved, production costs decreased more rapidly, and profit increased much more. Yet as a person who participated actively in the discussion of the principles of this reform in the stage of its preparation and who also worked as a manager of a production association under pre- and postreform conditions, I can bear witness to the fact that it indeed did not justify all of the hopes that were placed in it.

But let us ask ourselves this question: Why? Was it because the reform was based on false principles or because of other reasons?

I wish to decisively support the opinion of A. M. Birman: the principles of the reform were absolutely correct and its partial failures were generated exclusively by inconsistent, halfway implementation of these principles. It seems that two mistakes played the major role here. First, from the very beginning they did not establish strict state control over price setting (although the system of price setting was improved during the course of the reform of wholesale prices in 1967), as a result of which the profit at many

enterprises began to increase not as the result of an actual increase in the production volumes and the reduction of production costs, but as a result of an unsubstantiated increase in prices and in many cases the monetary incomes of the workers began to grow more rapidly than did the productivity of their labor.

Second, the more organized enterprises of heavy industry were the first to be changed over to the new conditions and only later came the enterprises of light and the food industry and the sphere of services: that is, those branches which create a material cover for the mass of money that is in the hands of the population. Moreover, the control over the prices of goods that determine the standard of living of the people was stricter.

As a result, the level of wages and the amount of money in the hands of the population began to increase more rapidly than the volume of consumer goods did. And the central planning and financial agencies, quite legitimately concerned about this disparity, instead of stepping up control over prices, begin to issue one additional set of instructions after another, limiting the growth of incentive funds and the average level of wages and introducing additional indicators which gradually nullified all of the ideas of the reform. In addition to payments for funds, they began to withdraw the residual free profit from the enterprises. The conditions for deductions into the incentive funds gradually became more difficult until there came to be no connection at all between the amounts of these funds and the results of the work of the enterprise's collective. Then maximum ceilings for bonuses were established, which were lowered from year to year.

Even the September (1965) Plenum of the CPSU Central Committee pointed out that with time the funds for the development of the enterprises would become the main source for updating the production capital and thus the enterprises would cease to be dependent upon the state budget and would be themselves responsible for the entire cycle of reproduction. Yet in practice the development funds were set at such a low level that not only reconstruction, but even current updating of equipment remained dependent on centralized allocations. Moreover these scanty funds were soon "centralized" and the enterprises were deprived of the possibility of disposing of them independently. The same thing happened to currency deductions from exported products.

But in and of itself the idea of self-renewal of the enterprises was absolutely correct not only from the standpoint of increasing the responsibility of the managers for maintaining the enterprises entrusted to them on a modern level, but also, which is even more important, it was useful as a factor in retarding the growth of prices for equipment. If a director acquires a new machine tool with budget allocations which will "vanish" after the first of January and moreover he will "get into trouble" because of incomplete assimilation of funds--it makes no difference to him how much this machine tool cost. But if he purchases this machine tool with his own "blood," money that has been earned, he will think twice about whether or not this machine tool is worth the price the manufacturer wants for it. Thus feedback appeared which helped agencies of the State Committee for Prices to keep a rein on those who wanted to raise prices without justification.



Unfortunately this did not happen and the prices for equipment slid upwards. Strange as it may be, there were no levels of government that were actually interested in opposing this tendency. Neither the manufacturer nor the consumer nor even the Ministry of Finance turned out to be interested in stabilizing and reducing prices. I shall give an example from the practice of the association in which I worked. One of the series-produced machine tools which we had assimilated successfully and quickly in time had begun to produce an extremely large amount of profit. Since the free residual profit was withdrawn into the budget and an increase in the amount of profit was in no way reflected in the growth of our consumer funds, we ourselves made the suggestion to reduce prices for this machine tool. It was difficult but the ministry finally agreed. The State Committee for Prices also agreed. Strangely, the Ministry of Finance objected and it objected strongly. At first we were unable to understand this paradox--it seemed to us that the finance department would be the first to be interested in reducing prices.. But then everything became clear: by withdrawing excess profit in the form of free residual the Ministry of Finance accumulates it easily and simply in the budget income. But when the prices are reduced the revenues coming into the budget decrease and the Ministry of Finance is not in a position to figure out who should have a reduction of the budget allocations intended for the consumption of these machine tools for they are distributed among dozens and even hundreds of addresses.

Let us sum up what has been said. In our opinion, the aforementioned failures of the 1965 reform are not at all related to its principles and not to the reevaluation of the role of profit and value indicators, but exclusively to its undecisive and inconsistent implementation. Instead of concentrating all forces on the main issue--price control, we took the path of minor limitations of the rights of enterprises, multiplying the number of indicators, as a result of which we distorted the initial intention of the reform and it lost its effectiveness to a considerable degree. It is necessary and useful to recall this right now when the large-scale experiment is expanding so as not to repeat mistakes of the past.

And so experience and common sense say that without strict control over prices one cannot create any system of indicators that motivates the enterprises to struggle for effectiveness of production. How is this carried out?

The price should reflect first of all the socially necessary expenditures per unit of consumer value, but it is also possible to deliberately move the price away from this for the sake of saving on raw material that is in short supply or encouraging the output of products or new technical equipment that are especially necessary. And the main thing is that the determination of its levels should be in the hands of the socialist stage and should be free of departmental and local influence.

It is also clear that the price should be based on labor normatives which, in turn, derive from technically substantiated norms and approved tariffs and wage rates. There are no arguments about these issues either among scientists or among production workers. The disputes arise around the practical realization of these points. And they argue mainly about three major issues:



is it necessary or possible in our rapidly moving age to create unified statewide or at least branch labor normatives as a firm basis for price setting? We note in passing that this issue pertains equally to the NChP);

is the unified state agency and the form of the State Committee for Prices, even with maximum expansion of its rights and apparatus, in a condition to determine or even monitor the many millions of prices in effect in the national economy?

how does one correctly construct a price so that it encourages the output of especially necessary products and also correctly reflects the actual contribution of the production collective to the total social product?

The answer to the first question is the most difficult. In certain branches which have a relatively unified and stable technology, for instance, in the textile industry and petrochemistry, unified branch normatives have been created and are being used successfully. But in many other branches, particularly in machine building and instrument building, because of the rapidity of changes and the varied nature of the output, various organizational structures and various levels of technical equipment of the enterprises, the creation of general branch stable normatives is hardly possible. But it would seem that this is what is necessary. In such conditions one can rely on the normative base of each individual enterprise, but then one must strictly make sure that the level they themselves reach does not wear thin and that in terms of labor expenditures per unit of useful effect newly assimilated items do not become more expensive. The fulfillment of this task is provided for even by existing price-setting methods if they are applied honestly and uncompromisingly.

As for the ability of the State Committee for Prices to keep price setting firmly in its own hands, in spite of the complexity of this task, it is also quite feasible to carry it out, in my opinion. And the main thing is that regardless of how difficult this task may be, there is no way to avoid dealing with it. Here one cannot agree with D. V. Valovoy that it is not at all mandatory to establish all 12 million prices centrally. We shall not try to judge whether it will be reliable or sufficient to establish 500 prices centrally, as D. V. Valovoy suggests, or 1,000 prices, but there is no doubt that we can and should single out a group of the most important products such as metal, fuel, energy, machine tools, equipment and the main kinds of agricultural products for which the prices should be scrupulously considered and approved by the State Committee for Prices. For the rest of the kinds of items it is sufficient for the State Committee for Prices to approve the corresponding methods and determine the agencies which will be entrusted with the approval of prices, and--the main thing--to introduce an inspection apparatus with the right to make a periodic inspection of all the organizations and the right to penalize the violators of these methods irreversibly and strictly.

How does one solve the third problem--creating equally advantageous prices for the producer for all of his products so as to remove from him the temptation of manipulating the products list for the sake of improving indicators?

A. M. Birman suggests establishing an approximately uniform level of profitability in the price of the products that are sold. But then the more hired labor, expensive materials and batching items that are included in it, the more advantageous it will be for the manufacturer. Then on the menus of our restaurants we will never see cabbage cutlets, but there will always be only tobacco chicken! This suggestion is the most vulnerable spot in the integrated and well-arranged concept of A. M. Birman.

It seems to us that D. V. Valovoy is right with respect to this question. Based on the advantages of the NChP he suggests calculating the profit in the same percentage of expenditures only of one's own live labor. In passing let us note that the practice of changing over to the NChP has shown that in places where this principle was violated and the NChP was "made" simply by subtracting the cost of enlisted labor from the old prices that were in effect, there was a sharp difference in the evaluation of the growth of output in terms of sales and in terms of the NChP and, the main thing, it was not possible to eliminate the difference products that were advantageous and disadvantageous for the enterprise. It was precisely this circumstance and not the fact that the NChP, as A. M. Birman correctly notes, is not reflected in bookkeeping, that led to a situation where the indicator of the NChP did not always work and the initial enthusiasm associated with its introduction waned to a considerable degree.

It seems to us that these contradictions not only can but should be eased by joining in "legal marriage" the indicator of the NChP with the indicator of sales. To do this it is necessary to revise all prices on the basis of the principle included in the NChP, that is, when calculating prices the profit should be calculated in the same percentage only for one's own labor expenditures. This does not at all preclude deliberate deviation from the given principle when necessary, for the sake of encouraging the output of one product or another through the introduction of increments to the prices for exports, for index "N", the establishment of temporary higher prices during the period of assimilation of complicated new machines and instruments, and so forth. But, we emphasized once again, the principle of mutual advantage should be the fundamental one in the price-setting policy. Then the indicator of sales is deprived of a considerable proportion of its shortcomings which were correctly pointed out by D. V. Valovoy, and it comes closer to the NChP, and profit becomes the main measurement of the effectiveness of production as is suggested by A. M. Birman. This is the main way, but not the only one. And here we agree with the idea that for a full evaluation it is necessary to have a system of indicators, but with the mandatory condition that these indicators are not mutually contradictory and that the number of them be minimal.

Yet many indicators currently in effect are not only superfluous, but clearly contradict one another, they tie the hands of the managers of enterprises and they change them from fighters for real effectiveness into sly manipulators of various figures.

Let us try to show this using examples. At one time designers of the Leningrad Metal Plant proved that the large components of hydroturbines could

be made more advantageously by welding than from steel lengths which the plant received from outside. This is what they did. The production cost decreased, profit increased, quality improved, and the total production cycles were accelerated. But the indicator of labor productivity dropped: previously all they had to do was to take the shavings from the "grandfather" casting that was obtained and the part was made. Now it was necessary to measure and cut a sheet, weld the blanks themselves and only after this could it go to the machine tool. The expenditures of their own labor increased sharply. By doing something that was advantageous for the state the plant suffered for a long time until the base for its labor productivity was adjusted.

A second example. For a long time the Leningrad Machine Tool-Building Association imeni Ya. M. Sverdlovsk manufactured mounted rotating tables for the coordinate-boring machine tools they produced. Then we began to obtain them from a specialized plant and the indicator of the productivity increased without any special effort on our part.

One can give an infinite number of examples like these. Today, for example, the enterprise is given separate plans for economizing on materials and reducing labor-intensiveness. But sometimes it is more advantageous to increase the expenditure of materials so as to save more live labor. Sometimes, on the contrary, it is better to invest more of one's own labor for the sake of a greater savings on costly material. For material in the final analysis is the same thing as embodied labor of the workers of the supply plant. As a rule, it is necessary to reduce production cost, but sometimes it is advantageous to increase them for the sake of improving quality for the consumers will not buy an item that is inexpensive but poorly made. Our light industry more and more frequently is encountering precisely this situation. Frequently it is necessary to sharply increase the output of products which are in short supply, even if the expense of the consumption of costly equipment and the enlistment of additional labor force. Here the production cost may not decrease, but the national economy receives products for which it has an extreme need. The enterprise will not be the loser either for the volume of sales and the mass of profit will increase.

The system of indicators should first of all protect the interests of the state and the society as a whole and at the same time not keep the enterprise from freely maneuvering all of the resources entrusted to it and should motivate the enterprise to increase the effectiveness of its production in all ways.

This general requirement of the socialist economy can also be expressed with this rule: the state and the higher organizations should dictate to the enterprise "what to do," should determine the conditions that stimulate the effectiveness of its operation, and at the same time should grant it a free choice of "how to do" that which is entrusted to it.

To do this, in our opinion, it is necessary and sufficient to leave the higher agencies with the following functions in the area of planning and control over the production activity of a cost-accounting [khozraschet] enterprise:



the determination of the profile (specialization) of production;

the approval of the plan for the products list and control over the fulfillment of deliveries of these products (observance of agreements);

the establishment of prices for the entire list of planned products;

the establishment of long-term rules which have the force of law for the distribution of the profit obtained by enterprises.

Here the main evaluating indicators are the fulfillment of the plan in physical terms (products list) and profit.

The question may arise: But what happens to production costs, labor productivity, wage funds, the number of personnel and many other indicators which are now mandatory? It is our profound conviction that with strict control over prices and the products list and with motivation on the part of the enterprise to obtain maximum profit, all these like, incidentally, many other indicators are unnecessary. The enterprise itself will not waste surplus materials, maintain surplus personnel or pay them money for nothing.

At first, taking into account the inertia of many years of habit and also the existing demographic situation, possibly, it would be worthwhile to establish additionally from above a limit on the maximum number of people. But, undoubtedly, one should grant the enterprise the right to decide for itself how many workers, engineering and technical personnel and employees it should maintain within this limit, including administrative and management personnel. It seems that it would be expedient for these limits to be established not by the ministries, but by the local agencies of Soviet power with the coordination of the Gosplan. We repeat: if the monitoring of the prices is carried out consistently and firmly and profit is made the basic criterion for economic effectiveness, with time all of the aforementioned indicators will become unnecessary or, rather, they will retain only their analytical, but not their directive function.

From what has been said one can see that the author, following A. M. Birman, attaches decisive significance to the profit indicator. It is known that certain economists have a disapproving attitude toward this concept and "unpleasant taste" in it, apparently remembering that the main goal of capitalist production is the drive for profit. But there is nothing more erroneous than to fail to distinguish between the nature of capitalist and socialist profit. The difference lies in how it is achieved and who acquires it. The capitalist creates profit through unlimited exploitation of its workers and sometimes even the consumers of his product. And the main thing is that the owner of the capital takes over the profit created by the workers and uses it in his own interests. Under socialism profit is placed at the disposal of the entire society and is used in the interests of all the workers. Even in the "Critique of the Gotha Program" K. Marx pointed out that in the future socialist society, based on the principles of collectivism, it would be impossible to distribute all of the "undivided labor income" among its creators and it would be necessary to subtract a certain part to make reimbursements for consumed production capital and its expansion, for the



creation of an insurance fund against accidents and natural disasters, for the coverage of general expenditures on management, maintenance of schools and public health institutions, for the creation of funds for maintaining disabled workers, and so forth.

Additionally, the growth of profit, with proper price control, adequately reflects all of the positive strides in the activity of the enterprise. Thus if the productivity of the workers increases--profit increases; if materials, energy and fuel are saved--again profit increases; if fixed capital is used better--again there is an increase in profit. And, finally, when there is an increase in the production volume, even with the same production costs, profit also increases.

But in order for profit to "work" correctly it is necessary to observe one more mandatory condition in addition to price control. It is necessary to establish "ironclad" rules for its distribution according to the share taken from the enterprise and the share left at its disposal. It is not mandatory for these norms to be standard or unified--they can be concretized with respect to the conditions of each enterprise. But they absolutely must be long-term in nature and have the force of law not only for the enterprise, but for all of the higher organizations. In other words they change as rarely as possible, no more frequently than once every 5-10 years and then by an act of legislation.

Only with the observance of such conditions will management, party and trade union leaders be able to really mobilize the collective for complete coverage and utilization of all reserves.

From that part of the profit which remains with the enterprise, in our opinion, one should pay first of all the fines for tardy deliveries and poor quality of products. This will be a powerful incentive to increase contractual discipline. Then, according to firmly established rules, the remaining sum should be divided into two parts: the fund for development and the fund for material incentives for the collective. Of course the fund for development, in addition to part of the profit, should also receive amortization deductions, and in considerably larger amounts than is the case at the present time.

Under the conditions of the scientific and technical revolution reequipment and reconstruction of enterprises should be not one-time but continuous in nature. Up to this point they depend on decisions of higher organizations and the responsibility of the director for the condition of the enterprise entrusted to him remains extremely conventional: if they have given money he will update it, if they have not he will throw up his hands: "What could I do?"

As a result we construct new plans for the assimilation of capacities is drawn out for many years and it is difficult to form collectives capable of working efficiently--and at the same time we doom to premature aging enterprises which have accumulated invaluable production experience. It would seem that budget and other centralized sources of financing should be used mainly for the development of the infrastructure and the construction of new enterprises in

Eastern regions of the country. And only in individual cases, when there is need for complete reconstruction of the existing enterprise for principally new products, is it permissible to use budget funds.

On the material incentive fund, in addition to providing for an increase in individual output, will become the main source of increasing the workers' earnings, as was intended from the very beginning. We should also like to draw attention to this aspect of the problem: if the growth of wages and other goods depends on the amount of the funds earned by their labor, there will be a sharp increase in the role of such forms of incentives as the 13th wage, bonuses for winners of socialist competition, the construction of housing, children's institutions, houses of recreation and so forth. All this will contribute to consolidating the collective, strengthening discipline, reducing turnover and developing a communist consciousness.

In addition to reducing the number of planning indicators, in our opinion, we should refrain from evaluating the work of the enterprise only in terms of the percentage of fulfillment of the plan and we should change over to evaluating it primarily in terms of the collective's advancement as compared to the preceding period. As long as 100 percent fulfillment of the plan is that fatal dividing line on one side of which is paradise and on the other--hell, we will never get rid of the striving of the enterprises for reduced plans and coverage of their own reserves.

As a measurement of progress one could use the increase in the output of products in physical terms if there are no limitations on raw material and sales, and also the growth of profit, which reflects all aspects of the enterprise's activity.

Measuring the successfulness of the work of production collectives in terms of the growth of product output in physical terms is the most reliable and visual but, unfortunately, it is applicable only in cases when the enterprise produces a limited and also a stable list of products with a constant quality of the initial raw material. Such conditions exist in petrochemistry, at dairies, in the production of standard fasteners, bearings, records and so forth. But this method is not appropriate for multiprofile machine-building enterprises with products lists that are constantly being updated or for many mining and timber enterprises with sharply changing geological and natural-geographical conditions for operation.

Moreover, when changing to intensive methods of management there will be an increase in the number of workers at the enterprises for whom the task of increasing the quantity of products is replaced by the task of improving their quality and increasing the effectiveness of production.

This is why, in our opinion, in the evaluation of the work of enterprises, along with the observance of agreements, more and more significance should be attached to the indicator of the growth of profit. But--let us emphasize once again--the reliability of this indicator, like, incidentally, all other economic indicators, will depend entirely on improvement of price setting.

The author is well aware that the considerations presented in this article do not exhaust all the crucial measures for further improvement of management of industrial production. In connection with the course toward strengthening delivery discipline there is the critical problem of increasing the reliability of the supply for enterprises. It would seem that this task should be carried out primarily through comprehensive development of the warehouse form of supply and wholesale trade in the system of territorial administrations of Gosnab. This will consolidate the orders to the suppliers of materials and thus will facilitate their fulfillment of contractual commitments and will also take a load from transportation and provide for more efficient maneuvering of material resources in regions where they are consumed. It is quite obvious that the multiprofile enterprise, having hundreds and sometimes thousands of orders and forced to make small deliveries, and far from achieving the norms for loading railroad cars, regardless of how much it wants to will never fulfill its contractual commitments by 100 percent.

As was envisioned by the school reform, it is extremely important to double the influx of youth to SPTU's in order to augment the working class. Apparently it is also time for a reform of higher and secondary specialized education. In particular, in the area of training engineers it has long been time to change over from extensive methods to intensive ones. Let us remember that we already have more than 5 million diplomaed engineers. In our opinion the time has come to sharply reduce admissions to technical VUZes and, through making the competitive selection and weeding out of mediocre students more stringent, improve the quality of the training of specialists. Nor would it hurt to think about changing over a number of tekhnikums to the training of workers with higher qualifications who are able to work "both with their heads and with their hands."

Modern production is extremely interested in precisely the type of specialist that is capable of adjusting machine tools with numerical program control, robots and GPS's, and acting as operators of gigantic converters and rolling mills and universal tools in the laboratory and the testing stand. But we, as before, are training the technician as a "cheap edition" of the engineer, who is helpless in the shop and on a modern machine tool and is not really needed in the design bureau because of the great surplus of engineers.

It is time to carry out more energetically the decisions of party congresses concerning the coming together of applied science and development with production through the inclusion of independent design bureaus and many applied scientific research institutes in production and scientific production associations. And this should not be done formally, but in actuality, with a transfer of personnel from the design bureaus and scientific research institutes to the industrial group, for the engineer-designer and researcher-applied scientist perform Operation No 1 in modern production and therefore should undoubtedly be included in the makeup of the total worker.

There are also other important problems that are awaiting solutions.

But first of all, as is shown by the experience of enterprises participating in the large-scale experiment, it is necessary to clearly determine the

principles themselves for further improvement of the economic mechanism and to clearly outline the rights and responsibilities of the socialist enterprise, having granted it sufficient space for maneuvering all of its resources and having placed on its shoulders all the responsibility for the results of its activity.

FOOTNOTE

1. EKO, No 9, 1983 and No 8, 1984.

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## NEW TRENDS IN INDUSTRIAL DESIGN DISCUSSED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 107-120

[Article by O. A. Kulikov, candidate of technical sciences, Volgograd Polytechnical Institute, and R. M. Granovskaya, doctor of pedagogical sciences, Leningrad Polytechnical Institute: "Developing the Thinking of the Designer"]

[Text] Why a Different Style of Thinking Is Needed

"Thirty models of the same type of electric razors are produced by 10 enterprises of six ministries. Specialists have proved that they could be successfully replaced by five to six base models."

"The productivity and purposes of robots, their sizes and price are approximately the same, but in terms of design they differ extremely. Try to organize repair of such diverse technical equipment! It would be good to start working right now on the best of them and if necessary to augment individual structures with successful solutions found in other branches. But the problem is that nobody is engaging in this kind of selection or generalization."

Similar statements dot the pages of PRAVDA and other publications.

One gets the impression that unification is being held back in spite of the fact that it, like combined assemblies<sup>3</sup> has obvious merits. For example, the time periods for the planning and assimilation of new technical equipment with optimal operational indicators are reduced from 4-6 to 1.5-2 years because of the utilization of previously assimilated components which have been tested in operation. Correspondingly, expenditures on the planning and assimilation of series production drop to two-thirds to one-half, the output of machines from the same production capacities increases and their production cost is reduced by 25-30 percent. One-half to one-third as many designers are needed. Nor should one forget about the fact that blueprints for any new parts require painstaking work, experience and skills of a draftsman-designer. The demands on their execution are constantly increasing. With combined assembly the need for blueprints is reduced to one-half to one-fourth. There are savings on metal and the labor of highly qualified machine tool operators, universal

lathe operators and so forth since it is not necessary to manufacture such a large number of original designs. Operation and repair of already familiar elements are simplified even if they are joined together into a new combination.

There is no doubt that when creating principally new machines one cannot get along without planning constituent parts with new designs. But it would be good to create them out of autonomous assembly units which, if necessary, could easily be unified.

Experience has already been accumulated in successful combined assembly.

It is known that Soviet artillery (especially 122-152-caliber) from the beginning until the end of the war surpassed the German machine guns in quality. By the beginning of the battle of Stalingrad our plants had produced such a large quantity of weapons that they provided for victory at Stalingrad, at the Kursk salient and in subsequent battles. But few people know that we owe this success in manufacturing weapons to the method of combined assembly which was successfully applied by their head designer F. F. Petrov. It was precisely with this method that the 1943 model of the 152-millimeter howitzer was developed by the time of the battle at the Kursk salient. It took less than 3 weeks to manufacture blueprints and five models.

A handyman of the Cherkassy Plant for telegraph equipment, Z. Zaytsev, during the 10 years he worked in a small laboratory designed 120 units of new, highly productive, highly durable equipment using components and parts of mechanisms and machines that had broken down. Documentation for his automated and semi-automated machines has been requested by 134 plants.

There are hundreds of automated lines joined together from unified components in operation at the plants. But, unfortunately, the method of combined assembly has still not won the proper recognition among designers. There are many reasons for this.

The very evaluation of the labor of this category of worker has become outdated. They are given credit for machines that are designed from original components, and they should be encouraged for creating new, more productive technical equipment out of standard parts that are well-developed. Many designers strive for originality, particularly because this makes it possible to submit an application for an invention: after all, the work of the design bureau is evaluated taking into account the authors' certificates obtained for new designs. Under these conditions the designer is least of all concerned about maximum application of standard elements.

And sometimes he simply does not know that he is "inventing the wheel" again. It never comes into anybody's mind to create a new, say, roller or ball bearing or to suggest a new assortment of rolled metal. It is sufficient to look through the catalogue and select that which is appropriate for the given machine. Yet for such mass parts as shafts, pistons, reduction gears for technical transmissions, standard pneumatic and hydraulic cylinders, the control equipment for them, and so forth there are neither standards nor reference guides nor information about where they can be acquired. Each

design bureau is forced to design "its own" analogous product or order it from various production bases. The quality of manufacture, naturally, is lower than with centralized production according to developed technology. At best the large plants create norms and universal parts and components for their own internal use. There is an unjustifiably large number of bolts, nuts, screws, springs and so forth produced individually for tractors, combines, passenger cars and trucks. The Volgograd Plant for Tractor Parts and Normals alone produces more than 1,000 kinds of springs for tractors.

When developing a method of combined assembly one cannot get along without specialized warehouses of parts and components for tractors, combines, trucks and unassembled equipment--obsolete or experimental which it has not been possible to introduce (this equipment is now immediately resmelted). From these the designers could create new machines and mechanisms directly from the metal, in many cases bypassing long and unproductive work on blueprints. For instance, in the warehouse at a large design bureau for tractors there should be all parts not only of various makes of tractors, but also of combines and trailer machines, and there could even be a set of automobile parts. Specialized warehouses expand the possibilities of interbranch cooperation.

It would be good to organize, similar to the central library, a central city, oblast or regional warehouse which would store numerous parts, blueprints for them and information about who produces them, how much they cost and where they can be acquired. In the future such warehouses should have a system of automatic addressing, search and delivery of the required part to the work position of the design assembler. Automated warehouses of blanks and parts are already appearing at the plants. Specialized design bureaus are developing better kinds of them with larger volumes of storage. Apparently the creation of warehouses will not especially impede designing in metal. A large design bureau which utilizes this method will also require a shop for manufacturing components that cannot be found in the warehouse or equipment for pressing or extruding individual parts or for the assembly or disassembly of variants of designed machines.

Traditional work positions of designers at drawing boards will also be retained. Of course it is necessary to have blueprints of parts that go into the machine and assembly blueprints of the component, machine tool and so forth, finally assembled in metal. But it is more rapid and efficient to have the variants "lose" directly in the metal than on paper. This style of work can be promoted in particular by...children's "erector" sets.

#### The "Erector" Set--Is Not at All for Play

Let us say that in the next few years industry provides standard components for plants that produce new technical equipment. Warehouses and the shops accompanying them will appear, which has already been discussed. We are convinced that the majority of designers, especially young ones, will not be able to design machines from prepared parts. As a rule, this path is considerably difficult than the ordinary one, especially if the specialist has not learned this from childhood and has not engaged in such design in school or in the VTUZ. The method of designing in metal presupposes a different style of thinking for the worker, and this must be developed.

Sometimes great hopes are placed in the idea that all students and designers have to do is master computer equipment and the quality and speed of designing and planning will automatically increase. Many VTUZes rely on the mastery of this technical equipment and the study of production, technology and the fundamentals of design have receded into the secondary (if not tertiary) plane. But without this knowledge the ability to use computers, microprocessor equipment and displays is like floating in the clouds with nothing to hang onto.

And so it turns out that many students know higher mathematics and can quickly process a series of data, and so forth, but they are not able to design the simplest device--they have not been taught this. In course and diplomaed projects they submit traced plant designs, sometimes even being unable even to explain their purpose and work. The same thing is true of technological processes: they are copied from plant operations charts and from these they "sum up" the calculations of the conditions for the feed-in.<sup>5</sup> An increase in the number of people employed in design bureaus from such engineers will hardly produce any advantage.

Many designs of new mechanisms turn out to be unsuccessful because their creators have not reached the optimal variant in their developments. And the reason is the same: in their preceding activities (including in childhood) they were not taught in thought and practice to select variants, and redoing blueprints, as was also noted, is a long and labor-intensive job.

Is it possible to successfully develop technical thinking while sitting at the drawing board or to perfect mastery and tempering, to install mechanisms on existing equipment intelligently and rapidly? In our opinion it is not. It seems that this problem would be largely solved if using existing "erector" sets better varieties of them were created. For example, the set "Erector-Mechanic" No 1 should be intended for schoolchildren in the first and second grades, No 2--third to fourth grades, No 3--fifth to sixth grades and No 4--seventh to eighth grades. Sets No 1-4 would correspond more or less to these requirements if one closed one's eyes to the poor quality of the parts and the cardboard packaging and polyethylene bags that are inconvenient to work with. But for students in the 9th-10th grades and tekhnikums, and for houses of young technicians and students and adults of design bureaus it is necessary to have sets called "Erector-Electromechanic" with a large number of various elements--drive devices, transmissions, reduction gears supplied with electric motors--with which it would be possible to design and test the operation of variants of various components of means of mechanization and automation, right up to small robots. Such sets have been created, for example in England, the GDR and Italy.

It should be noted that our innovators and scientists are creating many useful innovations by using even far from perfect existing "erector" sets. Thus the handyman M. Balasnov created lifting and lowering platforms this way for diagnosing and repairing the running parts of motor vehicles; a professor at the MVTU imeni N. E. Bauman, L.N. Reshetov invented a whole range of efficiency mechanisms; Dr of Technical Sciences and Laboratory Chief of the Institute of Mining imeni A. A. Skochinskiy of the USSR Academy of Sciences



Ye. V. Aleksandrov, using a child's erector set developed a system for transferring cargo from ship to ship in the open sea, created the best pick hammer in the world and so forth. There is no doubt that the effectiveness of work like this would increase significantly if we had better "erector" sets.

The administration for producing toys of the Ministry of Light Industry, unfortunately, is not enlisting many large design bureaus, student design bureaus or technical creativity circles in the solution to this problem. It would be good to instruct them to develop erector sets that can be assembled and disassembled and complicated toys that reflect the latest achievements of technology, and provide for mass output of these. But attractive toys which develop the love of work in children and instill in them an interest in occupations in which there is now a shortage, for instance, lather operator or fitter, would be created! Many parents would not mind paying 30-50 rubles to buy a small lathe that operates with an electric drive. At specialized enterprises for producing training and visual aids of the system for vocational and technical education there would be some point in arranging the output of typical standard parts, housings, bearings, shafts, toothed wheels, fasteners and so forth in previously determined sets. From these parts the young technician, following assembly directions or an assembly schematic, could put together and take apart standard mechanisms. It would be good to produce these parts from light alloys, plastics, textolites, pressboard, cardboard and so forth--this will make them lighter and less expensive.

The director of Moscow SGPTU-180, Hero of Socialist Labor V. Filippov and a group of students in the second course began to manufacture for schools of the city specializing in metal processing the ingenious instrument of the skilled lathe operator from the Novosibirsk Akademgorodok, G. Fedoseyev.<sup>6</sup> Fedoseyev transformed a little lathe into a universal instrument on which it is now possible to do a great deal--even weld.

Large foreign firms do not avoid the manufacture of toys. The managers of the Ford and General Motors companies enlist eminent scientists, engineers and artists in their development and execution and they openly admit that by developing the production of specialized toys they gain for themselves skilled personnel, specialists who are involved in their work.

The Italian firm [Uema] was the designer whose parts could be used by children to create many machines invented by Leonardo da Vinci: various lifting devices, a pile driver, a rock crusher and so forth. The parts were made from beech wood.

The English company [Koli Robika] designed a portable manipulator for assembling instruments, conducting laboratory research and demonstrating the fundamentals of robot technology to students. From its parts it is possible to assemble standard and original modifications. The manipulator equipped with pneumatic, magnetic and mechanical grips which move objects weighing up to 300 grams. It can be hooked up to any minicomputer. The drive is from six step motors.

## Our Experience in Combined Assembly

At the Volgograd Plant for Tractor Parts and Normals it has become customary to model things on the side from the erector set parts and to design directly in metal. Thus when creating a rough draft in parallel with blueprint sketches, in a couple of hours the developer assembles a model from erector sets. In some cases it helps to get a better idea of and interpret the movement of individual components and their interaction, and in other cases--to evaluate several different variants. Thus they developed, for example, the existing model of a feeder and transporter--it preceded the technical and working plans for a rotary aggregate for releasing springs which was introduced at the Volgograd Tractor Plant for Parts and Normals. Modeling on the side was also done when creating a mounting device for assembly and welding which is being used at eight enterprises. By the same path they arrived at a structure which feeds in parts for tempering with high-frequency currents, and so forth.

In the stage of the technical plant the plant innovators design means of mechanization and automation directly in metal. Standard unified parts and components and elements of equipment that has been written off are put to use. This is the way they created, for example, the automated line for technological compressing and finishing of springs, and an experimental installation for mechanized setting and tempering of springs. Designs developed using the method of combined assembly, as a rule, are quickly introduced into production.

The table gives two variants of the development (with the participation of the author--O. A. Kulikov) of leveling and tempering installation: according to the traditional scheme and by the method of modeling and designing in metal. It is clear that in the second, more progressive variant the time periods for the creation of an experimental model decreased to one-fourth and the cost of manufacture--to five-13ths.

Work according to the combined assembly method is done at the plant in the experimental shop. This is equipped with a warehouse of parts and components of written-off equipment and there is space where it is possible to construct the basis of the new experimental model. Original designs which are in short supply are manufactured right here on three machine tools, and only in rare cases are they manufactured in the repair and mechanics shop. During the past 10 years the shop has created six automated lines and five automated machine tools for their own plant, the Beloretsk Plant for Springs and the Gorkiy Krasnaya Etna Plant.

As a rule, a creative brigade of developers includes three innovators--a staff worker of the plant (the manager of the experimental shop, the universal lathe operator and the universal fitter, any of whom can handle milling and boring machines) and three or four students who are members of the special design bureau of the Volgograd Polytechnical Institute. The work is done in keeping with economic agreements or agreement for creative cooperation between the plant and the special design bureau.

Students were enlisted in this work for the first time in 1970 by the honored inventor of the USSR Yu. G. Mushchuk. Now under his leadership the creative brigade is working on a model of a complete automated line for manufacturing valve springs for tractor and truck engines. The students are full-fledged members of the brigade. It is not a simple matter to select them for a small collective which is to create new technical equipment in short periods of time. The many years of experience of the Volgograd Polytechnical Institute show that the method of combined assembly is mastered rapidly by those students who since childhood have been involved in circles for technical creativity or have independently mastered models and been interested in children's erector sets.

#### Setting-Tempering Installation

<u>Stages of Development</u>	<u>Workers</u>	<u>Expenditures, thousands of rubles</u>	<u>Time period, month</u>
Traditional Schema			
1. Technical proposal	2 designers	0.8	2
2. Rough draft	3 designers	1.8	4
3. Technical plan	5 designers	4.2	6
4. Working documentation of experimental model	10 designers	10.0	10
5. Manufacture of experimental model	Precise information unavailable		20
6. Adjustment and preliminary testing	1 designer 5 fitters	2.0	5
7. Adjustment of designs and circuits for automated equipment	3 designers 4 fitters	3.0	3
TOTAL		21.8	50

#### Modeling and Design in Metal

1. Technical proposal (including side modeling)	3 designers 2 laboratory workers	0.6	1
2. Rough draft	3 designers	0.45	1
3. Manufacture and assembly of experimental models using standard unified parts and components	1 designer 1 universal machine tool operator 2 fitters 2 laboratory workers	4.5	6
4. Adjustment and preliminary testing	1 designer 2 laboratory workers 2 fitters	1.2	2
5. Adjustment of designs and circuits for automated systems	2 designers 2 laboratory workers 2 fitters	1.5	2
TOTAL		8.25	12

For 15 years now the Volgograd Polytechnical Institute has been using the well-known game "Puzzles" to reveal in students inclinations for design work and to develop thinking in the area of combined assembly. Students who manage to quickly put together all kinds of surfaces of the figure are invited to the special design bureau where they design on paper and others use "Erector-Mechanics" sets. The strongest students are then sent to the client where they participate in practical studies in design and assembly of existing models (or experiment with models) of means of mechanization and automation.

Here the students are convinced that in addition to a knowledge of theory and the ability to invent and to use computer equipment and automated planning systems, in their future activity it will simply be necessary to have practical work skills and skills in designing means of minor mechanization and automation. Compiling technology, figuring out efficiency proposals that have been made, helping to introduce the most valuable of them, efficiently organizing the work place in your section, explaining why machine tools break down and so forth--all this cannot be learned simply from lectures and practical studies in the institute. Here it is difficult to overestimate the significance of the work in the special design bureau and creative brigades. It is precisely here that real course and diploma projects which are introduced into production are originated. For example, students of the machine-building faculty V. Kenzhagaliyev, N. Shagin, V. Kolesnikov, Ye. Saveliyeva and I. Filimonov during the 1983/84 school year as part of the creative brigade developed, manufactured and introduced an automated machine tool for polishing the faces of springs, an automated transportation device which joined the washing and the polishing combined with rinsing. They have manufactured and are testing a universal transporter-loader for metal products (springs, bolts, screws and so forth) which fold packaging. The student N. Shagin in conjunction with Yu. G. Mushchuk became the author of an efficiency proposal for a new variant of a flexible automated line.

Today there are clearly not enough "Erector-Mechanic" sets produced for the practical work of the designers and students. Workers of the special design bureau develop for themselves the blueprints for elements that can be assembled and disassembled from which it is possible to construct many existing models and mockups both in the design bureaus and plants and scientific research institutes and in the VTUZ's for demonstrating experiments in mechanics departments and for increasing the productivity and the quality of invention activity of future specialists. Understandably, it is impossible to envision parts for all of these cases and therefore in order to produce those which are in short supply it is necessary to have miniature machine tools. Unfortunately, these are very rare.

And so there have been developer enthusiasts who have suggested improving "Erector-Mechanics" sets and have been convinced of their undoubted practical value. Who will take responsibility for mass production of these? The fact is that since we are speaking about "only a child's toy" not a single ministry or enterprise that has anything to do with this is serious about the problem--designing and manufacturing these sets are far from being their main concern. We and the students are engaging in the realization of these proposals since we have the time and energy. At the present time the special design bureau of



the Volgograd Polytechnical Institute has made contact with the plant for forge and press equipment in Azov (Rostov Oblast) which produces "erector" sets. We are sending students there for production practice with suggestions for improving these sets. But this is still only a half-measure which is based on personal initiative "from below." All the work for improving the "erector" set is done outside the plan and the main responsibilities both in our institute and at the plant....

We are convinced that studying with the help of erector sets and developing habits of designing directly in metal are essentially improving the quality of the training of specialists, particularly in the area of planning means of mechanization, and lifting-transport and loading devices. But this requires the corresponding material base.

The issues that have been raised encompass the interests and responsibilities of many departments. Therefore it would be good for the USSR State Committee for Science and Technology to devote attention to the problem as a whole and to coordinate the efforts of organizations under various jurisdictions.

#### FOOTNOTES

1. Vasin, M. "Within the Power of Designers. In the Face of Many Kinds of Diversity," PRAVDA, 1 October 1983.
2. Gerasimov, V., Petrov, P. "A Branch Is Being Originated," PRAVDA, 27 November 1982.
3. Combined assembly is a principle for creating machines, equipment and instruments from unified standard aggregates (autonomous components) that are installed in an item in various numbers and combinations. The aggregates are fully interchangeable in terms of all operational indicators and joint sizes.
4. Loginov, A. "The Working Designer," IZVESTIYA, 24 October 1982.
5. Flerov, V. "Living With Involvement," IZVESTIYA, 23 September 1984.
6. Kozyrev, S. "Native Metal," KOMSOMOLSKAYA PRAVDA, 25 August 1984.

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11772

CSO: 1820/37

8 April 1986

## EDITOR OUTLINES ECONOMIC POLICY

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 121-136

[Readers' response to EKO articles]

[Text] The large amount of attention devoted to the formation of the younger generation of the working class by the party and the government is generally known. But there is still a good deal to do. It is no wonder that the EKO article elicited responses from the readers.

We are turning again to problems of the youth workers' dormitory. Since 6 million people under 30 years of age who are the country's future working class live here it is clear that the discussion of the dormitory goes beyond the framework of a discussion about housing alone. Youth dormitories represent a concentration of many youth problems, both social and economic. They have already been discussed on the pages of our magazine. In addition to the selection on the workers' dormitory there have also been the articles "Working Youth: Labor and Life" (No 4, 1977) and "We Are Constructing a Building--The Building Is Constructing Us" (No 1, 1985). We regard the materials in this issue as a continuation of these.

The Article Has Too Negative a Coloring

[Article by P. I. Tabalov, chief of the division for trade, housing-municipal services and consumer services of the USSR State Committee for Labor and Social Problems]

[Text] In the article by A. E. Kotlyar and M. I. Talalay, "How the Young Worker Lives," in our opinion, they touched upon a whole complex of tasks included in the economic and social plan: the formation of stable labor collectives, the personality of the young worker and so forth. But with all of its undoubted value and convincingness, it has a number of weak spots. First of all, it has too negative a coloring. What was described hardly corresponds to reality. It would be expedient to augment the article with

positive examples: advanced experience could be a reference point for improving conditions in the dormitories. But it would also be worthwhile to show that payment for living in the dormitories and other services are so insignificant in our country that they are practically not reflected in the budget of the young worker.

As for the organization of leisure in the dormitories, youth are hardly in need of this kind of supervision as it is recommended by the authors. A good deal here depends on the personal position and activity in social affairs. It is necessary to keep in mind that in the cities where most of the dormitories are located there are spectator and cultural-educational institutions which are popular among youth. Under these conditions it is hardly worthwhile for every dormitory to have clubs and circles, the more so since there are plenty of them at the enterprises.

Now about mandatory provision of those who live in dormitories with hotel-type housing and apartments. In the first place, at the dormitories where these possibilities exist the youth are provided with housing on a general basis. In the second place, will this not lead to an even greater outflow of youth from rural areas and a strengthening of the migration of the population throughout the country as a whole? In this connection one should not regard the problem of dormitories separately from other problems of labor resources.

One should also keep in mind that in recent years a number of measures have been taken directed toward improving the provision of youth with housing and municipal services. The decree of the CPSU Central Committee and the USSR Council of Ministers of 22 January 1981, "On Measures for Increasing State Assistance to Families With Children," envisions improvement of housing conditions for families with children and young marrieds through expanding their benefits when obtaining state housing and also with individual and cooperative instruction. Thus it is intended to grant to young marrieds in need of housing who first enter marriage under 30 years of age as a minimum one room, and for young families when a child is born in the first 3 years after their marriage--a one-room apartment. Additionally, this measure will be introduced gradually, beginning with regions of the Far East, Siberia, the European North and the Nonchernozem Zone of the RSFSR.

Additionally, the aforementioned decree envisions expansion of the construction of dormitories (above all according to new standard plans) and buildings of the hotel type, separating out individual rooms for young marrieds in the dormitories, and rendering all kinds of assistance to young families with individual and cooperative housing construction through granting priority rights for entering housing construction cooperatives. Moreover, in regions of the Far North, Siberia, the European North and the Nonchernozem Zone of the RSFSR the share of the initial contribution is set in the amount of 20 percent of the value of the apartment and it is 35 percent throughout the rest of the country.

In keeping with the decree, provisions have been developed and approved for a policy for granting young families interest-free loans for improving housing conditions or providing initial housing, which establish particular benefits for families with children. The loans are granted from the funds for social

and cultural measures and housing construction of the enterprises, organizations and kolkhozes. The introduction of these loans started also with the regions of the Far East, Siberia and the North--beginning on 1 April 1982 and ended on 1 April 1984 in the regions of Kazakhstan, Central Asia and Transcaucasia. Now young families can take advantage of this privilege everywhere.

In various regions of the country young marrieds are provided with housing in various ways--in keeping with local peculiarities and possibilities. There are many positive examples here--let us take those same youth housing complexes which are being constructed by the young marrieds themselves and where conditions are created for the organization of family leisure and public rearing of children.

The USSR State Committee for Labor and Social Problems and the AUCCTU made a decision concerning advantages in wages of workers in charge of dormitories as compared to housing organizations. The salaries of the people in charge of dormitories are determined depending on the amount of dwelling space in them, increasing by a coefficient of 3.

#### A Special Program Prepared and Approved

[Article by O. A. Zhagar, member of the State Committee for Civil Construction and Architecture under the USSR Gosstroy]

[Text] The article by A. E. Kotlyar and M. I. Talalay was discussed in the state civil construction administration. The authors are right in thinking that it is necessary to improve and expand the forms of social-domestic and cultural service for youth who live in dormitories. But, judging from the materials in the article, the research was conducted mainly in dormitories that were constructed according to plans developed before 1975.

In response to the decree of the USSR Council of Ministers and the AUCCTU of 6 September 1974, "On Measures for Further Improving Housing Conditions and Cultural and Domestic Service for Workers and Employees Living in Dormitories," the state civil construction administration has prepared and approved on 30 June 1975 a special program-assignment whereby, beginning in 1975, about 80 standard designs of dormitories were created for construction in all climatic regions of the country. Most of these plans envision the possibility of the habitation of young families. In 1982 the state civil construction administration made changes in plans for dormitories for workers and employees. They take into account conditions necessary for the habitation of young families with more than four members. These changes were approved by a decree of the USSR Gosstroy of 12 July 1983.

As for promises for public services at dormitories, they are envisioned by the norms and rules by which planning agencies of the country are guided today. Each dormitory should have premises for sanitary-hygienic, household-domestic and cultural-educational purposes, and also premises for public catering organizations. They can be located both in the building of the dormitory and in blocks that are added on or built into it.



The provision of children's preschool institutions for young families who live in dormitories, in our opinion, should be organized not to expanding the range of these premises included in each dormitory building, but through efficient distribution of dormitories for use with families in the planned structure of the microrayons with their inclusion in the citywide system of children's preschool institutions.

Taking into account the growing number of small (including young) families in the overall structure of the country's population, institutes of the USSR State Civil Construction Administration and the Gosstroy of the union republics have developed more than 150 plans for buildings with a small number of rooms in the apartments, including with elements of the primary forms of public service for the residents. Buildings of this type will help the local soviets of people's deputies and the enterprises in solving problems of housing young families of workers and employees.

It Is Not Ascetic Conditions and All Kinds of Restrictions That Make  
a Dormitory a Home for Residents, But Human Warmth and Comfort

[Article by V. S. Yevdokimov, division chief of the Komsomol Central Committee]

[Text] Why do certain young people prefer wandering aimlessly in the streets or visiting taverns to lectures and cultural expeditions to the theater or movies? Very frequently one hears references to the organization of the forms of leisure and the abundance of measures that have been taken. Is this true? Not entirely. Sociological research shows that organized forms of leisure occupy no more than 5-8 percent of the overall time budget of youth who live in dormitories. This means that the reason lies somewhere else.

A large proportion of the measures conducted in dormitories presuppose passive forms of participation on the part of the residents: lectures, conversations and so forth. And frequently the range of these is determined arbitrarily, without taking into account the interests of the young people and the timeliness of the issues that are discussed, and the content and level of these are not always on the highest level. The selection of measures is predetermined by the fact that the majority of them do not require serious efforts on the part of the organizers.

Sometimes forms of educational work used in shops, clubs and libraries are mechanically transferred to the dormitories. And this is wrong since under home conditions of the sort which should exist in the dormitory other work methods are needed. Moreover, sometimes the administration tries under all kinds of pretext to eliminate dances and personal holidays completely from the life of the youth. And there is basically one reason for this--things are more peaceful this way. And so omissions in educational work end up in self-organized forms of leisure which are not always distinguished by highly moral foundations. According to research conducted by scientists of the Ural Scientific Center of the USSR Academy of Sciences, an average of one-fifth of the financial budget of workers living in dormitories is spent on all kinds of revelry with the consumption of alcoholic beverages.

Without setting the task of analyzing all the problems relating to this, let us discuss individual ones. First of all--do the dormitories really need birthday parties, young people's weddings and other celebrations and rituals? Absolutely! For in the life of each young person there are events which he would like to celebrate with his friends. In families such festivities are usually celebrated with dinner, but in dormitories where there is a "dry law" they are held randomly, behind closed doors. Prohibition in and of itself does not eliminate the problem, but takes events out of the control of the public organizations and the educators.

They have managed to solve this problem in certain oblasts. Thus in the special-purpose comprehensive program for the development of workers' dormitories of Sverdlovsk Oblast under the 11th Five-Year Plan, which was adopted by the CPSU Obkom, the oblispolkom, the oblast trade union council and the AUCCTU obkom, it is recommended "introducing and disseminating new rituals and traditions...not allowing restrictions on weddings and other personal festivities in youth dormitories." This is probably a correct decision. It is not ascetic conditions and all kinds of restrictions that make a dormitory a home for residents, but human warmth and comfort.

Today every fifth resident of the workers' dormitory does not have a certificate of maturity and only half of them continue to study in schools and technicums. What are the reasons for the passivity of young workers and their lack of desire to raise their educational level? First of all it has been noted that the desire for learning is not the same in various dormitories and in various enterprises. And the decisive thing here is the microclimate in the dormitory and the prestige of education. The number of people who are studying is greatest in the dormitories which we call exemplary.

The second aspect which is of no small importance is the attitude of the administration and trade union and Komsomol organizations of the enterprise toward the training of the worker in the school. One cannot disregard the conditions for studying in the dormitory either. The public is not capable of resolving this issue fully. Interesting experience in work for raising the general educational level of young workers has been accumulated, for example, in the dormitories of Gorkiy and Voroshilovgrad oblasts, Tatariya and Latvia. In Norilsk Komsomol committees, educators and councils of the dormitories, with the help of evening schoolteachers, are organizing reference tables in all of the dormitories before the beginning of the school year. They analyzed the level of education of the people living there and hold individual meetings with the workers. During the process of the school year consultations are held in the dormitory and display tables are supplied with the necessary literature. The council keeps track of class attendance.

#### The Housing Problem--One of the Main Ones

[Text] When preparing materials concerning the problems of the young workers' dormitory the editorial staff was especially interested in the opinion of the workers on whom the solutions to many problems depend--the leaders of the ministries and departments. We sent them letters asking them to answer the following questions.

1. How important are the problems raised in the article, in your opinion?
2. What kind of provision of dormitories for working youth do you have in your branch (including dormitories for small families)? Are these adequate, in your opinion?
3. What steps is your branch taking to satisfy more fully the needs of youth for places in dormitories? For providing young families with rooms in dormitories for young families?
4. What difficulties are you encountering here?
5. What, in your opinion, is the role of the enterprise in solving this problem?

We are publishing the answers received by the editorial staff.

#### Success Lies in a Comprehensive Approach

[Article by V. N. Polyakov, minister of the USSR Automotive Industry]

[Text] One-third of the workers in our branch are youth under 30 years of age. Many of them live in dormitories. On the whole, 90 percent of those who need them are provided with places in dormitories. The turnover of young personnel amounts to an average of 10 percent. Dissatisfaction with housing and the lack of prospects of quickly obtaining permanent dwelling space are, as a rule, not the first among the reasons for leaving. But even with these statistics it is clear that the housing problems is one of the main ones that causes changing of jobs and if not directly, then indirectly it influences the turnover of young personnel.

We attach special significance to the construction of family dormitories. The ministry has set for the enterprises the task of orienting themselves in the plans for construction not toward the quantity of temporary housing for those who critically need it, but toward the need to retain young workers in production. Consequently it is necessary to establish the proportion of family dormitories in the overall volume of housing construction.

The difficulties we encounter are varied in nature. The existing provisions and instructions concerning dormitories has long been outdated. The funds allotted for acquiring equipment and furniture are too modest. The "rich" enterprises provide additional financing for the needs of dormitories from the funds for social and cultural measures. The modern dormitory is experiencing a critical need for good furniture--inexpensive, comfortable and varied. There are not enough skilled personnel or educators with a higher pedagogical education.

And although there is no standard plan for specialized family dormitories of the hotel type, this is not the main impediment to providing housing for young workers. At a number of our enterprises residential buildings with ordinary apartments are allotted for these kinds of dormitories. A small family receives a room in the apartment and the family provides its own furniture,

refrigerator, television set and household appliances--they will need all of this in their new place of residence as well. The conditions in the family dormitory, in our opinion, should be made as similar as possible to the conditions of the permanent residence.

The life and leisure of youth are well organized in the dormitories of the VAZ, ZIL, the KamAZ and the Yaroslav Motor Plant. The dormitories of the First State Bearing Plant (Moscow) have repeatedly been winners of the All-Union Socialist Competition. The experience of these enterprises shows that if the needs and demands of the dormitory are taken seriously and if the administration and public organizations render them constant and comprehensive assistance, many difficulties are overcome more successfully and the quality of educational work with youth improves. Thus at GPZ-1 the organization of work in dormitories is discussed at conferences with the general director and party-economic aktiv, and there are no less than two conferences a year.

The advanced experience of our enterprises shows that the successful activity of the dormitories is ensured by concentration of management, good arrangement of educational work, the development of socialist competition among the residents, and material incentives for the personnel. At GPZ-1 they have created a complex of dormitories which are nearby and have a common management. The number of residents is more than 800. As a rule, in the youth buildings there is a higher level of culture and organization of space. Most of the educators in them have a higher pedagogical education. It is possible to do a good deal to help them today. It is especially important to have supervision of the collectives of cultural and educational institutions of the city in the creation of special methodological councils which will conduct classes for educators and monitor their activity.

Thus the solution to the problems of the dormitory depend largely on the collectives of the enterprises themselves. They require an attentive attitude, sensitivity and constant concern for the young workers.

#### From a Solution to Social Problems to a Solution to Production Problems

[Response from the USSR Ministry of Ferrous Metallurgy]

[Text] It is no longer possible to solve production problems without solving social problems. Moreover, it is frequently the correct and prompt solution to social problems that is the guarantee of production success. As analysis shows, even with generally favorable results of the work for reducing labor turnover (at metallurgical enterprises it is lower than in the majority of other branches--in 1983 it amounted to little more than 12 percent), half of the people who leave are youth. Sociological investigations conducted at ferrous metallurgy enterprises established that the greatest proportion of those who leave have not been on the job very long: up to 1 year--more than 60 percent, up to 3 years--about 40 percent. Only 3-5 percent of the workers who leave have a length of service of 10 years and more. And this shows once again that the problem of labor turnover is largely a youth problem, and one of the main reasons for their quitting is their dissatisfaction with housing conditions.



For youth 25-30 years of age concerns about creating a family and raising children as well as good housing conditions become very important. At first metallurgy enterprises just during 3 years of the 11th Five-Year Plan 5.64 million square meters of dwelling space or almost 63,000 apartments were constructed and put into operation. But enterprises of the branch are still unable to provide individual well-arranged apartments for all who need them. Therefore the stage-by-stage solution to the housing problem suggested by the authors (bachelor dormitory--small family dormitory--apartment) can be accepted as a variant. If a young worker when he comes to the plant and receives a space in the dormitory knows that in the future when he has a family and if he has a good attitude toward labor he will receive a place in a family dormitory, and then an individual apartment, this will contribute to keeping him at the enterprise.

Enterprises of the branch now have 1,300 dormitories in which 129,000 people are living. During the years of the 11th-Five-Year Plan dormitories with an overall space of about 380,000 square meters will be constructed. The draft of the plan for social and economic development of ferrous metallurgy enterprises under the 12th Five-Year Plan envisions the construction of dormitories sufficient to satisfy all of the demand for housing of young workers.

We have accumulated experience in the construction of dormitories along with the construction of large production facilities. During the period of construction construction workers live in them and then they are turned over to industrial production personnel. A number of enterprises have developed long-range plans for improving the content of the service for dormitories as well.

For normal functioning of dormitories it is important for the administration of the enterprises and party, Komsomol and plant committees to pay constant attention. An example of the proper concern is provided by the Novolipetsk, Western Siberian, Magnitogorsk, Orsko-Khalilov and Chelyabinsk metallurgical combines and the Sokolovsko-Sarbaynsk and Mikhaylovskiy ore-enriching combines. All of the workers' dormitories have well-equipped facilities for the daily necessities: cafeterias, laundries, kitchens and so forth, and some of them have points for renting items, excepting laundry, cutting fabrics, repairing watches, dry cleaning, and there are also barber shops and dining rooms in operation. There are rooms for clubs with various interests and music rooms which in special cases are transformed into halls for festivities: weddings, birthdays and other important events which the young metallurgists can celebrate here among their friends. A bookmobile has been created and there are rooms for students, a photo laboratory and rooms for recreation. Near many of the dormitories are sports facilities and the enterprises have been concerned about acquiring the necessary sports equipment.

As a rule it has been arranged for shops to supervise the dormitories. Strengthening the patronage ties between the labor collectives and the youth in the dormitories, in our opinion, contributes to the settlement of residents according to the production principle so that it is possible to stabilize as much as possible the collective that has taken form in production. A good example of this is the dormitory of Sheet-Rolling Plant No 4 of the

Novolipetsk Combine. The patrons render assistance both in solving living problems and in educational work. This form is justifying itself. I think that in the future it will become more and more widespread.

In ferrous metallurgy the needs for dormitories for single people are now basically satisfied. Therefore we shall be oriented mainly toward construction of dormitories for small families of the hotel type, the need for which is satisfied by 60-70 percent. These dormitories should fully meet the growing demands placed on modern housing, where it possible after work to rest well and to spend leisure time in an interesting way. Despite the fact that the construction of dormitories of the hotel type requires somewhat greater expenditures, these expenditures will be recouped by the reduction of losses which the branch sustains because of increased turnover of young workers. At enterprises which do not yet have the possibility of constructing family dormitories it is necessary to allot for young families floors, sections or blocks in the dormitories for single people.

When selecting a place for constructing dormitories it is necessary to take into account the distance from the enterprise and, insofar as it is necessary, to provide the workers with transportation. In this the metallurgists can receive help from the local soviets of people's deputies. It is inadmissible for a worker to spend up to 3 hours a day on the road from the dormitory to the enterprise: this does not contribute to keeping him in production.

In our dormitories the provision of food products and industrial necessities is still poorly organized. Obviously, it is expedient for certain trade enterprises to organize their work in keeping with the shift schedule for the work of the metallurgists. In the dormitories for small families they should create children's rooms where the young parents can leave their children in the evening in order to go to the movies, theater, classes and so forth. To do this it is not even necessary to have additional personnel since the parents themselves can take turns staying home.

All these issues can be basically resolved by the metallurgical enterprises in conjunction with local party, soviet and administrative organizations. But there are also problems which a number of ministries and departments of metallurgy cannot resolve without help from planning agencies. These include, first and foremost, providing the dormitories with furniture, sanitary and technical equipment, a tiled stove, elevators, certain other construction materials and elements both for new construction and for repair of existing housing. Today the branch's need for construction materials to repair dormitories is not being provided for satisfactorily.

#### Joining Forces

[Article by A. T. Lavrentyeva, USSR deputy minister of light industry]

[Text] The USSR Ministry of Light Industry devotes special attention to the construction of dormitories and also to the education of their inhabitants since 14 percent of the industrial production personnel of the branch live here. At certain enterprises this percentage is much higher. Thus at the Cheboksary Cotton Combine imeni 60-Letiye USSR, the Kemerovo Silk Fabrics

Combine, the Chaykov Silk Fabrics Combine imeni 50-Letiye USSR it has reached 50 percent.

Of the 2,529 dormitories that are on the books of enterprises of the system of the USSR Ministry of Light Industry 60 percent are located in modern buildings, 34 percent--in adapted, well-arranged buildings, and the rest--in premises that do not have all kinds of conveniences. Since 1979 it has been prohibited to construct dormitories with the outdated corridor system. Now dormitories of the section type are being created and the planning of residential and auxiliary premises is more convenient in them. Under the current five-year plan alone 102 of these dormitories to accommodate 40,600 have been constructed.

Because of the fact that the old type of dormitories did not have space for dining rooms and cafeterias the enterprises were forced to build them on or to release other premises for the organization of public catering. Now 30 percent of the dormitories have self-service dining rooms or cafeterias. But the management of trade organizations do not always support their work, blaming the lack of personnel and the inefficiency of these points. As usual it is difficult to provide the dormitory with furniture --the timber and wood-processing industry is slow at getting started on manufacturing them.

Educational work among youth is improving, but there are difficulties here too. One feels the shortage and the great turnover of educators. The VUZes do not train them under a planned policy and the educators who come to this work receives less pay than schoolteachers do. The difference in the payment for their labor will be even greater after the school reform.

An incomplete solution to the housing problem on the scale of the country will make it impossible to promptly offer housing to young families. Enterprises of the branch are taking measures to construct dormitories for small families, but not on an adequate scale and the builders are not interested in them since these objects are labor-intensive and the practice of deducting 10 percent of the housing for the construction organizations does not apply to them. Up to this point 94,500 family people are living in dormitories of enterprises in the branch. Obviously there is some point in expanding cooperative housing construction for young families and rendering them assistance in making the down payment. There should also be a revision of the norms for equipping the dormitories with furniture and other supplies per one resident, and a number of other problems have not been solved either. It will be possible to provide the youth with full-value housing in work dormitories only by joining the forces of many branches and departments.

#### Problems of the Production Collective

[Article by L. V. Ignatyev, chief of the Administration for Organization of Labor, Wages and Personnel of the Ministry of the Electrical Equipment Industry]

[Text] The crucial nature of problems of the workers' dormitory for the electrical equipment industry is determined by the circumstance that the proportion of young workers under 30 years of age employed at enterprises of



the branch is about 40 percent, and the average of workers ranges from 35 to 36. Authors of the article in EKO correctly note that the dissatisfaction of the workers with housing conditions increases labor turnover, and this process is extremely painful both for the labor collectives and for the people who leave themselves. But even in cases when the fact that the young workers are not happy with their jobs does not entail their leaving, it has an unfavorable effect on their labor activity.

The ministry is doing a good deal to improve the housing conditions of the workers. During the first 3 years of the 11th Five-Year Plan 155,000 square meters of space in dormitories were put into operation. As of 1 January 1984 enterprises of the branch had 562,000 square meters of dormitory space. In 1984 and 1985 another 80,000 square meters will be put into operation. Now about 75,000 people are living in plant dormitories of the branch, and for one resident there are 7.6 square meters of space while the norm is 6 square meters.

But the demand of the enterprises for dormitories is not being fully satisfied. The main reason is the shortage of funds allotted for these purposes. Each year about 220 million rubles are allotted for housing construction in the branch and the USSR Gosplan allots only 140 million rubles. Yet for young workers who are creating families or preparing for this individual housing is becoming a primary factor. For the sake of housing the young worker is prepared to leave the enterprise, even if he is satisfied with everything else. From our standpoint it is necessary to construct small family dormitories in a quantity that would make it possible to offer a room to each young worker who needs one. Comfortable housing which makes it possible to care for a family would undoubtedly contribute to stabilizing the workers and would help them overcome difficulties in adapting to the production collective and their occupation.

If one takes the circumstances into account it becomes obvious that there is a need to solve a problem of providing housing as a problem of the production collective although it also has a clearly expressed regional content. Obviously the suggestion to transfer the entire volume of construction and distribution of housing to the hands of local authorities has a certain amount of justification: the provision of residents of the region with housing (it would be more unified and equal), but this does not take into account the important aspects related to drawing young workers into production. And is it really so bad when the enterprises compete among themselves by offering their workers better housing conditions!

#### If the Approach Is Informal

[Article by L. P. Zagaruy, chief of the Division for Personnel Training of the Dnepropetrovsk Machine-Building Plant (Dnepropetrovsk)]

[Text] The dormitory, in which a young worker spends a large part of his free time, to a significant degree forms his nature, interests and views and has an influence on the development of his personality. At our enterprise this was understood long ago and first and foremost by the plant management.



How does one organize the educational process in dormitories? How does one make it effective? These are the issues on which the administration, party, trade union and Komsomol committees as well as the plant's division for personnel training are working. By a joint decision of the board of directors, the party committee and the trade union committee, the staffs of educators have been transferred from the housing and municipal services to the division for personnel training at the plant. This has made it possible to regard them as engineering methodologists and to increase their wages from 90 to 150 rubles (plus bonus) per month. Because of this measure we have been unable to fill the role of educators with people who have a higher pedagogical education and experience in educating youth. We now have nine engineering methodologists with a higher pedagogical education. The senior engineer methodologist who is in charge of the group of educators has completed the pedagogical institute in the specialty of "instructor of pedagogy and psychology" and has 25 years of pedagogical experience.

By a joint decision of the board of directors, the party and trade union committees and the Komsomol committee, "On Enlisting Management Personnel and the Plant Community in the Improvement of Educational Work and Living Conditions for Youth Who Live in Dormitories," a schedule was established for monthly visits to the dormitories by representatives of the administration and public organizations of the shops and divisions. A coordination council was created whose purpose is to improve the education of youth living in dormitories. It enlists a broad aktiv to participate in ideological-political, moral, labor, aesthetic, physical and economic education and in improving living conditions for workers, employees and engineering and technical personnel who live in the plant dormitories.

The council includes representatives of public organizations and production subdivisions, supervisors of dormitories and mass sports and cultural organizations of the plants, mentors for youth, and workers in the personnel service, housing and municipal services, and the laboratories for psychological and sociological research and analysis. The duties of the coordination council include consideration of programs and plans for training and measures for educating youth who live in dormitories. It hears reports from councils of dormitories and managers of patron subdivisions, it analyzes them and then makes decisions concerning further improvement of the educational process in the dormitories. Through the efforts of the council the experience in joint work of the dormitory and the production patron subdivision is studied and generalized and competition-reviews are conducted for the best dormitory for educating youth.

Each enterprise can do a great deal in this area. It is necessary only to establish an interested and informal approach to its leadership.

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#### IMPORTANCE OF PROGRESS IN HOUSING NOTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 137-147

[Article by B. S. Pavlov, candidate of philosophical sciences, Institute of Economics of the Euroscientific Center of the USSR Academy of Sciences (Sverdlovsk). B. S. Pavlov has been studying workers' dormitories for more than 20 years. He is one of the developers of the special purpose comprehensive program for the development of workers' dormitories in Sverdlovsk Oblast]

[Text] In the article by A. E. Kotlyar and M. I. Talalay (EKO, No 10, 1984) it was noted that half of the residents they questioned were not completely satisfied with the housing and living conditions in dormitories (older population, noise, lack of comforts, unsatisfactory sanitary and hygienic conditions, and so forth). And these complaints are not without justification: in the majority of dormitories, as research conducted by Moscow sociologists showed, there are no dining rooms or cafeterias, one cannot turn in laundry or dry cleaning, and in 60 percent of the dormitories there is a critical shortage of furniture and the position of educators go vacant for months and sometimes for years, and if they are filled in many cases it is with workers who are professionally not qualified.... Did the authors spread it on too thick when describing the situation in the majority of dormitories of the country? We can say quite confidently that they did not. Moreover, it seems to us that the authors may not have spread it thick enough.

Beginning in 1968 in the Institute of Economics of the Ural Scientific Center of the USSR Academy of Sciences research has been conducted on the problems of the development of workers' dormitories. During these years they investigated hundreds of dormitories and conducted dozens of various questionnaires. In many cases they were repeated (every 3-4 years)--this makes it possible to judge the dynamics of the phenomenon.

Following the participants in the discussion we can repeat: in the past 15-20 years there have been essential changes both in the material base of the dormitories (construction according to new standard plans, expansion of the norms for equipment) and in the organization of the internal life of the collectives of youth. It would seem that these changes should have been

reflected in the satisfaction of the residents with their life and leisure. But these changes have not taken place. Just as 15-20 years ago the majority of residents (if not the overwhelming majority) are dissatisfied today with the same aspects of their daily life. Let us emphasize at once that we did not register the opinions of the same residents. In 20 years the workers in the dormitories of the country have accommodated, according to our calculations, about 8-10 generations of residents. In other words the commanders of the workers' dormitory during these years have registered in the house books and then released about 45-55 million residents!

Generations change, conditions improve...but the dissatisfaction remains the same. And there is nothing contradictory in this. During the past 15-20 years, as statistics show, the level of consumption in our country has approximately doubled. During a relatively short period in history people who live in families have changed the norms of their consumption both quantitatively and qualitatively. Their food now contains more calories ("undereating" has been replaced by the problem of "overeating"); they dress better and create a significant wardrobe of footwear and clothing (frequently apartments with built-in and ordinary dressers and chiffoniers are transformed into something like family branches of trade bases); they surround themselves with a mass of necessary, seminecessary and practically unnecessary things in their apartment; they try to obtain from the society (enterprise) as many square meters of housing as they can--separate, well-arranged and comfortable.

And from these conditions the young person goes into the dormitory. Here he is given approximately two-thirds to one-half as much dwelling space. Fewer square meters of housing and denser population. Add to this a 5-10-fold increase in the proportional load on sanitation and hygienic facilities: in addition to purely physical factors there is the problem of the quite predictable squeamishness that a person might feel; the lack of normal conditions for preparing food and storing groceries (the notorious string bags hanging out the windows); the noise and necessity of subordinating and coordinating one's interests with the interests of the neighbors, common instructions and provisions developed for these communal buildings; and, finally, the resident's lack of protection from the daily moralistic, sometimes uncompromisingness of the commander, the educator and other representatives of the administration and service personnel.

They say with friends like these who needs enemies? The individual adjusts rapidly to what is good. But to what is bad or very bad--here the mechanism of adaptation "rebels" and there is a permanent complex of dissatisfaction. The sharp point can be smoothed out by the awareness that it is temporary, the prospects for improvement and, finally, an understanding that there is no other choice.

For many young workers the dormitory is the worst variant of family living. As a rule there are not even any factors that "smooth out the sharp points." Obtaining individual housing is extremely problematical even for a family, not to mention someone without a family. Nor can one expect any radical improvement of things in the dormitory itself.

The attentive reader could not but notice in all of the correspondence about problems of the dormitory published in the press (both by scientists and by responsible workers) the same leitmotiv: in spite of the achievements in housing construction the problem with housing is still critical.... The dormitory is a type of housing which helps to cope with temporary difficulties. But the modern dormitories do not satisfy young people. Let us try thus-and-such in order to reduce this dissatisfaction.

Is this leitmotiv correct? Yes, but it is one-sided. And no wonder: there is the widespread opinion that the workers' dormitory as a social institution is principally unpromising. As the housing problem in the country is solved the need for this kind of housing will disappear of its own accord. But is this so?

The appearance and development of dormitories in the socialist society was brought about not only by an economic need, but also by a need of a social nature whose significance, in our opinion, will increase. As our society develops the standard of living of the population rises, the general educational and cultural level of the Soviet person increase, the means of information and movement improve, and systems of occupational training expand and become specialized. Because of this one should obviously expect increased migratory mobility of the population, and primarily of youth. The majority of young people are separated from their parents and move to another population point while they are still single, which also determines their economic and domestic needs and interests.

For young people who do not have families a public organization of their life is preferable: nutrition, care for housing, observance of sanitation and hygiene, organization of leisure. This can be done most effectively only by means of collective living--the dormitory. In addition to this, people of approximately the same age and the same level of social maturity living together provides a favorable environment for forming the personality of the young person which to some degree fills in the "vacuum" of communication which is formed as a result of his departure from his family. In the dormitory it is possible to organize most effectively the social control of the behavior of youth, which is especially necessary for the immature groups. Herein lies one of the main reasons for the social necessity of organizing youth dormitories, including workers' dormitories.

We ask anybody who doubts this to imagine the situation in which PTU students who are hired after the 8th-10th grades would receive from the administration keys to individual rooms or one-room apartments in ordinary buildings. You study here in the school and you live--there.... One must have a developed imagination in order to envision what would happen in these rooms and apartments after a week, a month or a year. A slight analogue to this could be situations that arise today in many dormitories of the system of vocational and technical education.

The broad prospects of the dormitories are dictated not only by the needs of nonfamily groups of youth. Dormitories, it turns out, are necessary for families as well, especially young marrieds. The desire for separation and for an individual apartment which was clearly manifested in the 1950's and



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1960's can be regarded as a unique dialectical fork in the development of socialist life. Abandoning the communal apartment or the heavily populated dormitory, people were trying to get away from the boredom, the inconveniences in living and, consequently, the squabbles with the neighbors brought about by these inconveniences. But having received the desired separate housing, the family lost the advantages of the communal type of housing, mainly: extensive possibilities of communication, cooperation and mutual support when organizing life and especially rearing children. The future family needs housing that combines the pluses of individual and communal housing and, naturally, eliminates its minuses.

Is this task being carried out today? Partially, yes. First of all--with respect to architecture. But, in addition to successful plans, there are also many which are not successful. It is necessary to weed them out in the planning stage. But they are embodied in concrete, brick and glass. And they will stand for dozens of years. Here one should sound the alarm: they say that this is architectural defects! But there is nobody to sound the alarm to. There is no point in telling the architects themselves about their defective work and there is no point in telling the administration of the enterprise either (they built them, they do not want to tear them down), but the changing generations of residents have all the less time (and there is no one to give advice) to dig in to the initial causes of the inconveniences (if only they had heat, if the water would run and the lights would not go out).

But the building is only the covering, the external conditions for creating internal comfort. But what is within? Yes the standard norms for equipment have been increased. A "bed" has now come to be somewhat more expensive than it was, say, 10 years ago. But in part this increased cost has come about as a result of the increased cost of furniture and equipment manufactured from more modern designs. Let us take a look at what has improved the residential room during the past 15-20 years. Perhaps it is only the table lamps (or sconce) for each resident and for each bookshelf. And today the selection of furniture and supplies placed at the disposal of the resident makes it possible to satisfy only the minimum "surface" layer of needs for the urban resident: to sleep--a bed, to hang clothing--an armoire, to eat--a table, to sit--a chair. But the degree of satisfaction of even the first layer is extremely relative. As a rule, clothing cannot be placed in the narrow space of the wall cupboard. And in order to eat it is necessary to cook, and this requires pots and pans, plates and spoons. And--a place to keep them. The problem of free burners in the kitchen (and then the problem of storing leftovers--and how can one get along without this?)....

Such chains of problems face the residents when satisfying other daily needs as well: laundry, maintaining bodily hygiene, sewing and repair of clothing and footwear, protecting the health. And moreover each individual has his own cultural demands....

And so today a need has arisen:

to improve the equipment of each residential room and the dormitory as a whole, and the outside of the dormitory and its environment;

to enrich the environment offered by the society (enterprise) as compared to what is acquired (achieved) with one's own housing;

to expand self-service and more aggressively introduce elements of public catering and communal living; to think about the ratio between conveniences for various categories of residents ("long-term" and "transit"; active in public life and passive, and so forth).

These are only a couple of aspects of the life activity of the dormitories which require improvement and research. There are also successful discoveries, some of which were mentioned in EKO in the preceding selection. But is there in the country an organization (institute, subdivision) which would gather, generalize and disseminate this experience and, possibly, even conduct centralized experiments? There is no such organization. The development of dormitories is proceeding randomly and one of the main factors causing this randomness is departmental jurisdiction. It begins with rules, provisions and instructions which are thought up and approved by various ministries, departments and individual enterprises for "their own" dormitories. And what "deviations" from the average do you find there? There can be a 2-2.5-fold difference in the payment for apartments, for example, which absolutely must be available in certain dormitories is not even envisioned in the provisions for others. That which is permitted in certain dormitories is not recommended in others and strictly prohibited in still others. The closer to the dormitory the more ramified the departmental permissive and prohibitive activity. Today one can find dormitories in which the administration in a noble desire to develop harmoniously the residence under their jurisdiction gives them the duty of seeing movies, reading a certain number of books, and so forth. As a rule, as punishment for failure to follow the instructions they use "eviction for disobedience."

The problem is that the departmental nature of general life management today have been transformed into departmental responsibility for the state of affairs. Is there a mechanism for influencing higher organizations and the managers of enterprises who would increase the responsibility of the latter for the condition of the dormitories under their jurisdiction? Yes, it would seem that there is. The managers can call "on the carpet" dozens of higher organizations at the level of city, oblast, republic, branch and country as a whole. And they do this fairly frequently. But, in the first place, their turn does not come so quickly: there are thousands of enterprises! And, in the second place, even if they get their turn, people are not fired for the poor condition of dormitories (at least in 15 years of research we have not had occasion to encounter such an incident) or even severely scolded or reprimanded. The cavalier attitude toward the organization of lives and service for the residents of dormitories also has its underlying causes: they say that there is nothing to cause dissatisfaction, after all the place in the dormitory is offered almost free of charge....

The activity of the administration in the dormitories under its jurisdiction is largely passed off as favorable today. They wanted it--they did it. It was built--it was allotted, it came into their head--they organized it. But if they did not want to, wait.... In the article entitled "In the Dormitory as at Home" (TRUD, 7 April 1981) the chairman of the Chelyabinsk Oblast Trade

Union Council, V. Kolosok, writes: "I have repeatedly heard of the dormitory at the Chelyabinsk Footwear Association as one of the best in our city.... How did it achieve this?--I was interested. It turned out that the general director, I. Fedulov, personally participates in the life of dormitory and frequently visits the workers.... During one of these meetings the residents went to I. Fedulov and asked that the dormitory be equipped with refrigerators.... After a certain amount of time they appeared in the corridors of the dormitory. In exactly the same way, at the request of the residents, the general director contributed to the appearance in the dormitory of a point for renting radio equipment, dishware and other necessities in life...." Indeed Comrade Fedulov is a good guy. It is good that such managers exist. In the majority of enterprises it is a problem to entice them into the dormitory (and one can understand their reluctance--it is embarrassing to look at shameful conditions that exist there) and to ask them to allot additional funds--is even more difficult. Yet the manager's personal contact with the life of the dormitory seems to us to be extremely fruitful. "In order to correct shortcomings in our dormitory," wrote one young worker in a questionnaire, "it would be necessary to have our director live in one of the rooms for a week or two. Just let him live there."

Departmental influences in the development of dormitories has one other facet: the family has plenty of babysitters. Try to calculate how many organizations and services participate (or at least should participate) in the operation of the entire complex of housing-domestic and spiritual goods which taken together are called "communal living." How many of these, public subdivisions and social institutes which, in addition to organizational matters, are called upon to perform functions of management and control over the life activity of youth buildings? We calculated this: more than 15! Try today to ask the administration of the dormitory or this same educator: Could one of you look at least a month in advance to when the next commission will appear? What aspect of the work will be done? Along what line--educational or economic?

Such a situation, on the one hand, is not really bad: it was because of the pike in the river that the carp did not fall asleep.... But in reality the following takes place. These commissions are organized without coordination. Frequently the same aspects of dormitory life are inspected, according to previously drawn up time-worn reminders. The role of the inspectors, as a rule, amounts not to assistance, but to written registration of the existence or lack of various conditions. It is still a problem if the team of inspectors are sufficiently competent, but the results of the inspection are not taken into account. But the real problem is that this happens rarely....

They say that a person becomes accustomed to everything. One can even adapt to inspections and to living in dormitories. Plenty of blank forms for reference information have been prepared; there is a reserve of rooms and plenty of activists for whom it would be desirable to bring in a commission; convincing explanations have been prepared for one shortcoming or another, but still there is a mess. Many dormitories have arranged a system of emergency preparation of premises and the collective for the forthcoming visit. The vestibule is cleaned up. The senior person in charge, Aunt Masha, is elegantly dressed "for the occasion". The menu is full (there are even hot outlets!) in the cafeteria. The rooms of the residents are carefully picked



up. The burnt-out light bulbs are all replaced. As if inadvertently the cleaning lady has left the door to one of the nice rooms open. Certain thrifty commanders have saved some runners for the lighted places.... If the commission is especially serious and there is time for preparation, they repaint the walls, replace all of the blinds, tablecloths, broken decanters and radios, and they update the agitation posters. During the days of the visit the commissions envision measures so that the inspectors do not come in contact with the residents who are not doing so well....

And how do the residents themselves rate such inspections? This question was asked of 2,668 residents of 46 dormitories: "What is your attitude toward the commissions which visit the dormitory from the higher organizations?" Here are the answers (in percentages of the overall number questions):

such visits are beneficial. The work of the administration and housing-domestic conditions and so forth improve--41.3 percent;

they do no apparent good--20.0 percent;

the commissions make no changes in the life of the dormitory--23.3 percent;

they impede things; they make the residents and administration nervous, and so forth--6.9 percent;

did not answer the question--8.6 percent.

Of course inspections are not at the heart of the matter today. Their content and attributes are only a trace of a deeper cause of the poor conditions. There is no coordination, there is no agreement on goals, paths and forms of achievement and, consequently, they do not receive the desired effect from joining forces and funds. As a result, there are frequent cases in which all of the energy of the organizers, like steam in an old steam engine, goes into the whistle.

And another problem caused by departmental management--the notorious problem of the educator. This position is one of the vacant ones in the dormitory. One of our recent one-time inspections in Sverdlovsk Oblast, for example, showed that out of 418 jobs for educators only 320 were filled. And the reasons for this chronic understaffing are not so deep or hard to recognize: try to find among the professions for employee specialists one that has less prestige, is more difficult or is less attractive! The dispersion of the functions (they have to do everything in the dormitory); the inconvenience work schedule (evenings, work on days off and holidays); the dual and sometimes even triple jurisdiction, the lack of provision of permanent housing, children's preschool institutions and so forth. But what then causes a worker to take such positions? For the majority of them it is the room that is provided (in the same dormitory), the possibility of being registered in large cities; or a temporary harbor in a disorderly labor biography.

Many writers writing in the press about this problem against suggest turning to the administration of the enterprises. They say that then the wages will be brought in line and so forth.... But this semi-beneficial activity in many



cases are accompanied by financial violations and they simply close their eyes to them. Thus the staff of educators are transferred from the housing and municipal services to the plant's division for personnel training. This makes it possible to count them as engineer methodologists and to increase their wages from 90 to 150 rubles. Is this good or bad? Obviously, for the specific enterprise, for the dormitory and for the given worker it is good. Can one recommend this for more widespread practice? Obviously not. And solving the problem of the educator it is necessary to have not departmental independence, but statewide centralized measures. Why should the administration of the enterprises twist themselves inside out and have financial violations in order to provide the dormitory with a worthwhile worker? Incidentally, about the professional competence of the educator. Its level, unfortunately, is not always satisfactory. As a panacea it is suggested that we organize at VUZes divisions for preparing educators for workers' dormitories. It seems to us that this is an obvious delusion. With the high interoccupational and migrational mobility of educators, the work of these divisions will be in vain (as far as the dormitories are concerned). Five years of training and a half year of work--and then there is no professional educator in the dormitory. A more promising and realistic path is stationary (at VUZes) specialization of workers who have already "gotten used to" the dormitories.

During past decades our party and government and public organizations have been devoting a great deal of attention to the development of workers' dormitories. Let us look at the "Basic Directions for the Economic and Social Development of the USSR During 1981-1985 and the Period Up to 1990." One of the directions envisions "consistently improving housing conditions for Soviet people and increasing the comfort of housing and raising the level of their arrangement. Expanding the network of youth dormitories at enterprises and organizations and improving services in them." As we can see a long-term task is being set for developing dormitories as a specific social institution. And we should keep up with this.

And one more interesting observation, in our opinion, should be mentioned. At a whole number of interbranch trade union schools the author of the article asks hundreds of students the same question: "Imagine that your son or daughter was going to a different city (to study or work) and he has to choose one of three places of residence: with relatives, in a private apartment or in a dormitory similar to the one in which you are working now. What would you advise your son (daughter)?" It is typical that only two or three educators would send their own children to the dormitory in which they work.

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CSO: 1820/37

8 April 1986

## TABLES REVEAL LIFE IN WORKERS' DORMITORY

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 147-154

[Tables: "How the Workers' Dormitory Operates"]

Question: How is life organized in your room?

The questionnaire was circulated in dormitories of Sverdlovsk Oblast and 2,668 people residing in 46 dormitories were questioned.

Variants of answers from the overall number of those questioned:

A "commune was created, and we participated in the creation of the monetary fund	13.5%
We did not create the overall fund but in difficult cases we help one another materially	40.2%
We lend money to one another	43.9%
We do not lend money to one another	2.4%

Question: What is your opinion about the pass system at the entrance to the dormitory?

The contingent of people questioned was the same.

Variants of answers:

It is necessary because it contributes to maintaining order in the dormitory	75.5%
We could do without it	9.2%
The entry to the dormitories should be free	11.9%
Did not answer the question	3.4%

Question: Is there a television set in your room?

Zlataoust (Chelyabinsk Oblast), 523 dormitory residents

Variants of answers:

There is no television set	25.8%
The television set is rented	60.0%
I have my own television set	11.1%

Question: What kind of equipment, games and sports equipment are there in your room?

Cherepovets, 1,612 dormitory residents

Variants of answers:

Camera	12.5%
Tape recorder	14.6%
Record player	19.5%
Transistor radio	14.5%
Skis	13.5%
Skates	6.4%
Musical instruments	6.8%
Checkers and chess	24.4%
Cards	22.0%

Question: Where do you usually eat on your days off and holidays?

The cities of Staryy Oskol, Gubkin, 144 dormitory residents

Variants of answers:

I cook for myself	37.5%
We cook together in the room	50.7%
In the cafeteria or dining room of the dormitory	13.9%
In the cafe or restaurant	6.9%
In dining rooms of the city	23.6%
With friends (relatives, acquaintances)	15.3%
Wherever necessary	18.1%

Question: What was the reason for your leaving the dormitory?

The cities of Sverdlovsk, Serov and Polevskoy, 888 dormitory residents at the time of their departure

Variants of answers:

Changed jobs	42.8%
Got married	34.7%
Was called into the army	7.8%
Left to study in a day division (VUZ, tekhnikum)	6.4%
Other reasons	8.3%

Question: Are you going to stay in this city or leave?

Contingent of both questions was the same

Variants of answers:

I'm going to leave	46.2%
I'm going to stay	53.8%

Question: How is your monthly budget distributed among the items of expenditure?

Irbit, 192 dormitory residents

<u>Area of Expenditures</u>	<u>Proportion of Monthly Earnings, %</u>	
	<u>Men</u>	<u>Women</u>
Food	33.7	38.1
Clothing	30.1	30.4
Cultural entertainment	9.4	8.4
Revelry involving alcohol	20.6	16.4
Not accounted for	6.2	6.7

Question: Do you have friends and comrades in the city?

The cities of Staryy Oskol and Gubkin, 144 dormitory residents

Variants of answer:

Not yet	4.2%
Yes	95.8%

Question: What games do you like to play?

Orenburg and the cities of Orenburg Oblast, 831 dormitory residents

Variants of answers:

Chess	17.2%
Lotto	10.7%
Checkers	41.9%
Cards	27.2%
Billiards	12.8%
Dominoes	22.9%
Table tennis	25.0%
No answer	28.0%

Question: What was your job before coming to the dormitory as an educator?

26 oblasts of the Ukraine, 592 educators in dormitories

Variants of answers:

A kindergarten educator	7.9%
A teacher in a school	36.8%
Worker	4.2%



An employee (without a higher education)	18.9%
An educator in another dormitory	7.3%
A political worker in the army	4.9%
A cultural worker	2.4%
An engineering and technical worker	2.2%
In selected public work	1.7%
Other variants	13.7%

Question: Who is for you the authority in questions of art, literature, the art of behavior and so forth?

The contingent of those questions was the same

Variants of answers:

A friend or comrade	31.3%
A coworker (working together)	8.8%
An educator in a dormitory	7.0%
One of the parents or relatives	7.2%
A teacher or instructor	4.7%
Simply an acquaintance	12.0%
There is no such authority	25.3%
No answer to the question	3.7%

Question: Do you remember if during the past month there have been in your dormitory representatives of the enterprise which has jurisdiction over it?

Cities of Sverdlovsk Oblast and Altay Kray and the city of Cherepovets (Chelyabinsk Oblast), 214 dormitory educators

Variants of answers:

They came from the housing division	38.3%
From the plant Komsomol committee	42.6%
Representatives of the board of directors of the enterprise	20.2%
Members of the party committee	17.0%
From patronage collectives	39.4%

Question: If you were the director or an important management worker who could intervene in the life of the dormitory what would you do first?

The contingent of those questioned was the same

Variants of answers:

I would improve the overall living conditions	43.3%
I would improve the sanitary and hygienic conditions	16.7%
I would reorganize the food system	13.6%
I would provide the dormitory with supplies and furniture	35.0%
I would arrange effective communications with organizations where the dormitory residents work	36.0%
I would organize circles for various interests	38.2%

I would develop mass sports and tourism	34.5%
I would reorganize mass cultural work	40.2%
I would introduce real self-management in the dormitories	11.2%

Question: How do you prefer to go to the movies, to concerts and to the theater?

The cities of Sverdlovsk, Kachkanar, 1,047 dormitory residents

Variants of answers:

Alone, by myself	8.7%
With friends or comrades	59.5%
Collectively in culture trips	15.8%
It makes no difference	13.2%
Did not answer the question	2.8%

Question: How do you usually spend your days off?

Contingent of those questioned the same

Variants of answers:

In the dormitory	72.0%
In the dormitory, but I go out	31.0%
I do not spend it in the dormitory	5.3%
Did not answer the question	3.7%

Question: Do you go to your parents or relatives at difficult times for assistance or advice?

Zlataoust (Chelyabinsk Oblast), 532 dormitory residents

Variants of answers:

No	12.4%
Not always	42.8%
I go frequently	37.9%
Did not answer	6.9%

Question: How frequently do you go home to your family, parents or relatives?

Orenburg and the cities of Orenburg Oblast, 831 dormitory residents

Variants of answers:

I do not go at all	4.5%
Rarely, as a rule, on vacation	43.7%
No more frequently than once a month	34.1%
Practically every day off	16.1%
Did not answer the question	1.6%

Question: Do you help your parents or do you receive help from them?

Cities of Sverdlovsk and Irbit, 432 dormitory residents

Variants of answers:

I help my parents (I send an average of 17 rubles a month)	22.0%
I receive help (an average of about 20 rubles a month)	11.0%

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## RESPONSIBILITY FOR HOUSING TRACED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 155-158

[Article by L. Shcherbakova: "Let Us Move Along the Chain...."]

[Text] And so the responses that came into the editorial office confirm that the problem of providing young workers with comfortable modern housing exists, regardless of whether or not the existence of this problem is suspected in the department. It is also obvious that it is possible to provide full-value housing for working youth only by joining the forces of many ministries and departments.

But, as the letters to the editors show, the importance of the issues under discussion is frequently not recognized for the people whose job it is to keep track of them on the scale of the country. One is alarmed, for example, by the evaluation of the situation in workers' dormitories expressed by the representative of the USSR State Committee for Labor and Social Problems. One is also alarmed by the fact that the superior organizations are frequently in a position of "keeping up" with decisions that are made "in pursuit" of practice which has forged ahead.

What attracts the attention of our readers most?

Do all of the decrees "work"? Recently many authoritative decrees have been adopted which defend the interests of young workers. P. I. Tobalov wrote about this. But to adopt them is only the beginning. It is necessary to make them "work." But what happens in reality? The housing code points out that young families have (along with other categories) the right for preferential acquisition of housing. As a minimum they should be granted a room, and if they have children--a one-room apartment. But then the code has a stipulation that this is done under a policy established by the oblispolkoms. As practice shows far from all oblispolkoms have adopted and informed the trade union committees of this policy. In this case what should guide the trade union committees of the enterprises?

Let us take the question of granting loans. They should be granted from the fund for social, cultural and domestic purposes. But this fund is used for capital construction and expenditures on kindergartens and day nurseries,



Pioneer camps, recreation bases and many other things. Even large, economically strong enterprises are unable to grant loans for individual construction. And this is not really encouraged in the cities, especially the large ones, where the shortage of space is keenly felt and where the so-called "private sector" is always paying. It would seem that this is not the solution for the young worker when solving his housing problem. It is also difficult to take advantage of the right to cooperative construction. Mainly because in the cooperatives there are immense waiting lines and preference is deservedly given here to veterans of the Great Patriotic War and labor veterans. Moreover there are few young people who do not engage in "moonlighting" and other "outside" ways of earning money have enough of it to join the cooperative. This path too is closed off.

Let us imagine a difficult situation: a young person discharged from the army has found a job, acquires a place in a dormitory and gets married. The head of a family is, of course, in line for housing. But here is one example: in the automotive base of a large construction organization there are 328 people in line for better housing and youth are at the end.... Where am I to live?--the head of the young family asks the manager. And here is practically the only solution--a dormitory for young families.

Legal imperfections. They pertain mainly to dormitories for young families. First of all, is this a dormitory or an apartment? Who gives the order--the enterprise or the rayispolkom? This question is not at all secondary. If it is the enterprise then it has the right to insist that workers who leave the enterprise move out. Otherwise the dormitory can turn into something analogous to the Dormitory imeni the Monk Bertold Shvarts (remember I. IIs and Ye. Petrov). Is it possible to exchange a room in a dormitory for young families? Is it possible to put somebody else in there, for example, the parents? Sometimes the legal indefiniteness concerning dormitories for young families lead to conflicts with the procurators' offices?

The quality of the plans for dormitories. O. A. Zhagar says in his response that the USSR Gosstroy has a fairly large number of plans for dormitories, including those for small families. But, as a rule, these plans are all of the same type and do not differ from one another significantly. Moreover, the Gosgrazhdanstroy did not engage seriously in standard dormitories until 1983--dormitories for young workers with families. This is precisely why the enterprises were forced for several decades to "smooth over" the last of the simplest sanitary and hygienic conveniences, cafeterias and other premises necessary for the dormitories.

And people are not willing everywhere to construct dormitories for small families according to the proposed plans. Here, for example, is one such a plan: a block for four families consists of four residential zones (an area of 30 square meters each) divided into two rooms. They have--two baths, two sinks, two showers, two toilets and a kitchen. It would seem that the domestic needs are still not fully satisfied. Perhaps this is why many enterprises prefer to construct dormitories for small families in ordinary residential buildings?

Or perhaps one should take the path of constructing buildings with one-room apartments? This makes the life of the young family more stable and closer to the conditions of the permanent resident. Here the young housewife does everything the way she likes it. This housing will no longer have the sense of "temporariness." The planning of such dormitories for small families is probably impeded by the normative for the ratio between useful dwelling space and the overall area of the department, which is determined by the Grazhdanstroy.

When expanding the selection of premises in the dormitory one should not, in our opinion, strive to encompass all aspects of the life of the young individual. Certain dormitories are now even organizing training classes. And at the same time evening schools are empty.

The responses received by EKO show that for the time being in the approach to youth problems including problems of the youth workers' dormitory there is no coordination among various departments responsible for various aspects of their life. Perhaps this is why we have not yet received an answer from the trade union organizations which, it seems to us, should be the first to be concerned about the state of affairs in young workers' dormitories.

Practically all of the letters that have come in to the editorial staff have discussed the special role of the enterprise in solving these problems. If managers with initiative are working at the enterprise there is order in the dormitory as well.

But is an informal approach all that is needed? It would seem that much will change if the collections of the enterprises are granted greater rights in various aspects of their activity, including that which pertains to the construction and operation of young workers' dormitories. The kinds of dormitories a specific enterprise needs today should be decided not centrally, but by the enterprise itself, its collective and its administration. Against them are the outdated legal norms which prohibit, for example, the organization of dormitories for young families in ordinary residential buildings (which was written about in EKO by A. V. Tiys). And, consequently, they are forced to maneuver constantly among the inspection commissions.

The situation with furniture and the supply of inventory for the dormitories improved somewhat with the introduction of the new normatives. Now the value of the furniture per one resident in a dormitory is set at 277 rubles, and taking into account all other premises in the dormitory--314 rubles, 24 kopecks. These standard norms have been approved by the USSR Gosplan, the USSR Gosstroy and the USSR Ministry of Finance on 5 December 1983.

As practice shows, there are examples of successful operation of dormitories in the country. But what difficulties are encountered by the manager who wants to make the dormitory more comfortable and more convenient to live in!

Here is one of the examples of work in the dormitories for small families of C. Bakademstroy (Novosibirsk). There the repair is done by the residents themselves. They are supplied with materials by the municipal housing

administration. As a rule, people are more careful with a room or a kitchen which they have repaired with their own hands.

Perhaps the main thing the managers of enterprises need today is a unified approach on the part of various levels of authority to the solution to problems of the workers' dormitories. And here the AUCCTU, the State Committee for Labor and Social Problems and the Komsomol Central Committee should have their say. It would seem that the most radical solution would be to develop a so-called ladder: youth dormitory--dormitory for small families --apartment.

Educational work should be done more resolutely and skillfully. Here is the opinion of our reader V. N. Bondarenko, an engineer from Krasnodar: "It is necessary to increase the wage rates for all service personnel of the dormitory and then men will go to work there, including retired military. The need for this is especially great for male dormitories. The rates are low not only for educators, but also for electricians, handymen and carpenters (79-90 rubles). Therefore the people who go to work in the dormitory are frequently drunks who cannot get a job anywhere else or people who are working two jobs and come only once a week. Thus even the most wonderful structures are destroyed from within.

In the response to the state committee for labor and social problems it says correctly: "One should not forget that the payment for housing in dormitories and other services are so insignificant in our country that they are practically not reflected in the budget of the young workers." All this is true. But we must not counterpose the inexpensiveness and comfort, concern for the budget of the young worker and lack of concern for his life. Party decisions require something else.

What kind of dormitory would we like to see? The EKO editorial staff is impressed by the principles suggested by the readers: the kind where the managers of the enterprises and other management personnel, and also those who work in the dormitory, would not be ashamed to send their children there.

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## EQUIPMENT SUPPLY PRESENTS PROBLEMS

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 159-161

[Article by O. N. Mashkovich and M. I. Anotskiy, candidates of technical sciences, and V. G. Kiryanchuk, V. I. Pugachev and R. A. Rumyantsev, engineers, Transvzryvtorm Trust (Moscow): "Builders Must Create Their Own Equipment"]

[Text] In construction ministries and departments the increase in labor productivity is provided mainly through rapid technical reequipment. The builders receive most of their new equipment from machine-building branches. But certain mechanisms they are forced to create and series manufacture themselves. For example, in the Ministry of Transport Construction the proportion of machines and mechanisms they produce themselves amounts to about 10 percent of the overall fleet of equipment that is operated, and there is a tendency toward an increase here. While under the 10th Five-Year Plan 54 kinds of machines were manufactured in the system of transport construction, under the 11th Five-Year Plan there will be twice as many with a simultaneous increase in the volumes of output of individual kinds of technical equipment.<sup>1</sup>

Modern road construction equipment is created, as a rule, on the basis of industrial tractors, large cargo trucks with increased rough road performance and other series-produced machines. On the basis of caterpillar tractors, for example, the Ministry of Transport Construction has successfully created three generations of drilling machines. Their mass output will make it possible to successfully solve important branch problems, including the construction of the BAM, reducing purchases of imported equipment to a minimum.<sup>2</sup>

At the same time the attempt to expand the area of application of these machines which involved changing them over to more effective electric energy was not justified. The fact is that a radical change in the plans of the cab and the replacement of the diesel engine with an electric one would have been necessary, that is, it would have been necessary to make the tractor all over. But this is inefficient. For the same reason we are not able to create a specialized machine with electric drive for drilling explosion wells in mine faces with small productivity. And this is critically needed. At these mines it is necessary to use powerful drilling machines which are produced by mining



machine building. In terms of productivity and other characteristics their parameters significantly exceed (2-3-fold) the needs of the enterprises.

When developing the technical assignment for new drilling tools it was established that a caterpillar drive cart of the tractor type of the modern hydraulic excavator of the EO-4124 type best meets the requirements placed on the base machine. It has been produced by the Ministry of Construction, Road and Municipal Machine Building since 1980. But this cart is not delivered individually and it is inadmissible to disassemble the excavators. What is the solution to this problem? Either to organize in the Ministry of Transport Construction intrabranh production of these caterpillar engines according to the already rejected principle of the development of the "natural economy" or to use assembled tractor chassis with components and parts of the T-130 tractor.

The need for drilling equipment is also forcing other branches to attempt to solve the problem by themselves. Thus the VNIPIRudmash Institute, on an assignment from the Ministry of Heavy Machine Building, in 1981 developed caterpillar undercarriages for drilling machines of the SBSH type (weighing up to 90 tons) and loading machines (weighing 32 and 40 tons) on the basis of elements of the running gear of the T-130 tractor.

Foreign experience shows that the majority of excavators, drilling machines and other special-purpose machines are installed, as a rule, on unified caterpillar drive devices of the tractor type which are produced by specialized firms. In past years the VNIISTroybormash Institute and the Soyuzekskavator VPO have conducted the necessary work for unification and preparation of specialized production of parts and components for the running gears of the tractor type for the needs of their own branch. But why only their own? After all, other branches of the national economy are experiencing a critical need for them. And who more than the Ministry of Construction, Road and Municipal Machine Building, which produces construction and road equipment, should be assigned to provide them.

Even approximate calculations show that the overall national economic effect from specialized production of unified caterpillar drive devices can be extremely significant. Thus the economic effect from manufacturing new drilling equipment on the basis of this for the needs of the Ministry of Transport construction alone is calculated in the millions of rubles per year. And if one keeps in mind the dozens of other special kinds of construction equipment in each branch and the overall number of branches needing modern highly reliable and durable caterpillar movers for new technical equipment, the total effect will increase by a factor of 2.

The state committee for science and technology and the planning agency should accelerate the solution to this problem.

#### FOOTNOTES

1. Mitrofanov, Yu. M., "Increasing Labor Productivity," TRANSPORTNOYE STROITELSTVO, No 9, 1983.

2. Adashev, I. S., Rumyantsev, R. A., and Pugachev, V. I., "Design Principles of Road Construction Drilling Machines," TRANSPORTNOYE STROITELSTVO, No 9, 1982.

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## IMPROVEMENT SEEN IN SUPPLY ORGANIZATION

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 161-165

[Article by A. M. Lavrov, candidate of economic sciences, chief of the Kuzbassmetalloznabsbyt Association, and A. A. Andriasyan, chief of the contract and legal division of the association (Kemerovo): "Supply Association Improves Its Functions"]

[Text] Economic agreements are the basis of the plans for any supply and sales organization. This means that their fulfillment must be the main indicator of the work as compared to all the others. Yet this important principle of planning is not maintained. Thus each year the plan assigned to our association for metal processing is increased as compared to the contractual commitments that have been adopted for the delivery of products from the metal base by 15,000-20,000 tons. Hence the difference between the planning indicator sent down from above and the control figures provided by contractual commitments for warehouse sales, incomes, outlays and so forth. And so it turns out that at the beginning of the planning period the collective has no confidence that it will fulfill the indicators that have been sent down. Of course, there are also objective reasons for this difference. There arises, for example, the need for more rapid deliveries of metal products to those enterprises and organizations where, because of the ministries and departments, the breakdown of annual funds for the various quarters does not correspond to their needs; or it is necessary to provide resources for so-called "nonplanned objects"; or it is necessary to support enterprises that have been changed over to comprehensive guaranteed supply, and so forth.

It seems that the lion's share of these additional deliveries are the result of planning expenses on the part of the ministries and departments. It is reflected in a disbalance of plans for the distribution of resources and programs for production and construction. As a rule, these contradictions are resolved at the territorial level of management of supply and sales organizations, which have a negative effect on the activity of the latter.

The fulfillment of contractual commitments depends on the provision of material resources. For each agreement accepted by the association there should be guaranteed resources in the products list. To do this it is

necessary to determine correctly the total specified need and to assign consumer enterprises to supply enterprises by issuing order-schedules and efficiently utilizing the funds that are allotted. An important source for augmenting resources is the mobilization of above-normative and unutilized supplies and commercial metal scraps, and also conducting exchange operations.

Efficient organization of the association's structure helps to plan and control the fulfillment of contractual commitments efficiently. Today Kuzbassmetalosnabsbyt have functional and commercial divisions. The former include the planning-economics, bookkeeping-financial, and contractual-legal divisions, the division for organization of labor and wages, and others. The commercial divisions draw up and carry out plans for material and technical supply for the assigned kinds of metal products. They include divisions for ordinary, high-quality and sheet metal, metal items, pipes, irons and ferrous alloys. In recent years essential changes have taken place in the commercial divisions: the utilization of computer equipment has expanded and a large number of "commercial" problems are being solved within the framework of the ASU Metall. Requirements placed on the workers of these divisions have also increased. With the current organizational structure of the association the commodity expert-engineer of the commercial division is assigned to a certain kind of product should have universal abilities. When drawing up and implementing the plans for material and technical supply for his products list, he determines the consolidated specific need, schedule-orders, utilization of the funds that are allotted, and so forth. Possibly this method of labor organization is justified with manual processing of information. But one must not forget that each of the aforementioned functions is closely linked to the main evaluation indicator--the level of fulfillment of contractual commitments. And the main shortcoming in the structure of the association is that it does not make it possible to evaluate functions in a differentiated way from the standpoint of the fulfillment of this indicators.

The introduction of computer equipment gives each function in material and technical supply a certain amount of autonomy. It is assigned to the corresponding organizational unit and is quantitatively evaluated from the standpoint of the basic indicator. Because of this all stages in the planning and implementation of plans for material and technical supply can be considered through the prism of fulfillment of contractual commitments.

The association is redistributing the functions among the commercial divisions and the newly created functional subdivisions. Thus on the basis of the commercial divisions they have formed:

a division for control over deliveries of metal products to other economic regions;

a production-technical division which concentrates functions for automation of problems using computer equipment;

A division for material resources and balances which performs functions for planning Gosstab products lists, processing fund notifications and mobilizing resources.



In 1982 they took workers engaged in accounting for the fulfillment of contractual commitments for transit deliveries out of the commercial divisions and join them into a unified transit group.<sup>1</sup> The technology of this accounting changed qualitatively: accounts of suppliers that come in from the bank each day are supplemented by the bookkeeping and financial division and are transferred to the transit groups for interpretation and entry into the journals for accounting for the fulfillment of contractual commitments.

The association's planning and economics division has been instructed to calculate the level of fulfillment of contractual commitments no less frequently than once a month; the bookkeeping and financial division has been instructed in the same time periods to report the condition of indebtedness of the consumer enterprises; and the division for material resources and balances must report the availability of above-normative or surplus products on the basis of forms of statistical reporting.

What does this do? First of all it provides daily reliable reporting of the fulfillment of commitments and the possibility of conducting high-quality accounting of fines, promptly informing commercial divisions of the necessary measures for realizing the allotted funds, discovering cases in which the supply plants which have contractual relations with the association are keeping accounts without notifying the association or are releasing products without orders. And the main thing is that it has become possible during the quarter, under the conditions of the agreement, to change the quantity of products that are delivered in the time periods for delivery, depending on the availability of above-normative or surplus products, and also the ability of the consumers to pay.

A task is now being set to locate some of the workers of the transit group directly in the metallurgical enterprises of the Kuzbass (Western Siberian Metallurgical Plant and the Kuznetsk Combine) so that they can influence the fulfillment of contractual commitments on the spot.

It would seem that in the future the construction of commercial divisions should be done not only according to commercial, but also according to functional factors. Such a division is possible only with extensive introduction of plans for ASU. In this case the results of the work of one subdivision (for example, the loading of metal bases with contractual commitments taking into account their capacities) will be entered into a data bank for use by other subdivisions.

For successful fulfillment of agreement it is of principal importance to have prompt issuance of fund notifications by the ministries and departments and schedule-orders--by union main supply and sales organizations. Practice shows that the established policy and the time periods for the issuance of funds frequently are not observed.

Point 90 of the "Provisions for Deliveries of Products for Production and Technical Purposes" gives material and technical supply agencies the right to hold ministries and departments liable for being late in submitting figures concerning distribution of funds. But, unfortunately, it is not always

possible to take advantage of this right. For example, in 1982 the association made a claim against the Ministry of Tractor and Agricultural Machine Building for an amount of 8,500 rubles because they issued fund notifications late. Having received no answer we were forced to sue in the arbitration court under the Moscow Gorispolkom. They threw out the suit referring to the idea that the defendant was not on cost accounting. As a result, the association, having paid the state customs, sustained a loss of 340 rubles. How can one fail to agree with the opinion of the corresponding member of the USSR Academy of Sciences V. V. Laptev that the administrative center of the branch cannot remain outside of cost accounting.<sup>2</sup>

The union main supply and sales administrations do not always observe the established time periods for issuing schedule orders either. Thus when forming contractual commitments for the Kuzbassmetalloznabsbyt Association for the first half of 1983, the Main Union Metal Administration issued only 85.3 percent of the schedule orders for metal products on time. Naturally, this subsequently had an effect on the time periods and the quality of the fulfillment of commitments.

#### FOOTNOTES

1. There are two forms of supply for the consumers: a) transit delivery directly from the supply enterprises to the consumer enterprises in large batches, as a rule, by rail; b) warehouse delivery is carried out from the enterprises of the USSR Gosnab in small batches, as a rule, by automotive transportation.
2. Laptev, V. V., "The Economic Agreement as an Instrument in Planning," EKO, No 4, 1983.

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## MANAGERS EVALUATE THEIR OWN WORK

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 165-166

[Article by G. A. Merkif, candidate of economic sciences (Kaunas): "Self-Evaluation of the Manager"]

[Text] A manager like any other person can have inborn shortcomings and minor weaknesses. For instance, it is more pleasant for him to meet and discuss business matters with those people for whom he has friendly feelings. And with those to whom he is for some reason unsympathetic he tries to put off communication even though, perhaps, the interests of the matter require that the meeting be held earlier. There is also a natural desire to do, in the first place, more interesting work and, in the second place, that with which he feels more confident. To do it he will put off some unpleasant task although it should be done earlier. There is also such a human weakness as a desire to hear and learn what he wants to hear and learn and not what is actually the case in reality.

In order to avoid these shortcomings the manager must monitor himself periodically: has he not given in to current trivia or to his mood?

I suggest a simple form of self-evaluation. One draws up a table which includes only four columns: the name of the worker with whom the manager has met; the frequency of the meetings during the course of the month; the nature of the interrelations; the person who took the initiative for having a meeting. We are speaking about individual communication, and larger meetings and conferences, of course, do not count.

Try to fill out such a table for one month and then analyze it. You will find your own answer to the question of whether or not you have used the time for conversation with your subordinates correctly. For if a manager has not called a subordinate into his office and has not gone to his workplace for a long time and has not found out what the subordinate thinks about his work, he will be too late in finding out about the difficulties that arise and sometimes he will be so late that it is no longer possible to rectify the situation. Nor can one fail to take into account the fact that certain workers themselves are unwilling to go to management. And if they are not

called in periodically, valuable proposals can go unexpressed and serious problems that arise in work can go unclarified.

Filling in such a table will give the manager food for objective evaluation and this means it will help him to work better.

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INFORMATION BUREAU FOR PLANT ASSISTANCE SUGGESTED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 166-167

[Article by G. A. Revzyuk, engineer (Leningrad): "I Suggest Information Bureaus for Interplant Mutual Assistance"]

[Text] Every industrial enterprise always has some unutilized reserves of production capacities. And this is not only the result of poor planning or unsatisfactory organization of production. Even with perfect planning there are reserves--they are formed even in the stage of planning the enterprise and providing it with equipment. Let us assume that in order to fulfill its program a shop needs one to three bending presses--and two presses are installed; according to the calculation it needs three or four milling machines and four are installed, and so forth.

Reserves of capacities appear also when the structure of the plan changes, which is especially noticeable at plants with individual and small-series production. How do they utilize these? I suggest creating city bureaus for interplant mutual assistance. The functions of the bureaus are also informational: to receive orders from enterprises in need of temporary assistance; to inform those who could render it (we have in mind assistance in carrying out various kinds of technological processes such as forging, smelting, stamping, bending, gas cutting, welding, all kinds of mechanical cutting and coating, and also fitting and assembly work and so forth).

But along with their requests the plant absolutely must send the bureau information about their readiness to help others in performing individual technological processes for which they temporarily have reserves. At the same time the "supply and demand" can approximately equal the assistance received and the services granted to another enterprise (in norm-hours).

The work of the information bureau for interplant mutual assistance is organized on the principle of cost accounting, that is, enterprises which desire to receive the necessary information must become subscribers and pay an annual subscriber fee. The main principle of the work of the bureaus is efficiency of providing information. The enterprise should receive an answer to its request on the same day or in the extreme case--on the next day. The

bureau notifies it of which enterprise can render assistance and in what volume (in norm-hours).

It makes sense to organize such information bureaus primarily in cities (oblasts) with multibranch industries (Moscow, Leningrad, Kharkov, Sverdlovsk, Kuybyshev, Gorkiy, Novosibirsk and so forth). And already from the results of their work one can judge the expediency of creating such bureaus in other industrial centers of the country.

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#### RECOMMENDATIONS GIVEN FOR SAVING TIME

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 168-172

[Translation from the magazine MOGERNI RIZENI, No 2, 1984 by Yu. Baronova: "Thirty Hits...Against the Shortage of Time"]

[Text] Do not worry, reader, this is not a test. But if you are always short of time try to answer these questions, and the main thing--pay attention to the recommendations which follow after them.

1. At each moment do you have an immediate goal towards which you are striving? Do you each day draw up a list of tasks which absolutely must be done and, additionally, a list of assignments which it would be desirable to carry out? Prepare lists of chores for future weeks and the month. This will help to distribute your time better.
2. Do you take priorities into account? In a list of assignments for the day order them according to importance. It is desirable to do this the night before.
3. Are you able to find at least an hour for creative work? Use "time without a telephone" for this (see Question 16) and morning hours.
4. Do you have a sense of what time it is? Try to conduct this experiment: try to do without a watch for one working day and one day off a week. You will be surprised at how confidently you can guess the time. Then try to determine what time it is once a day. Each day spend the same time on routine work. See for yourself how your evaluations of the time improve from day to day.
5. Do you give your colleagues the opportunity to show their worth? By entrusting more to them you will increase their satisfaction with their work and free up your own time.
6. Do you delegate routine work? Analyze your daily tasks in detail. Which of them could be done by a less qualified worker?

7. Do you manage to delegate small one-time jobs? There are many jobs which you absolutely do not need to do yourself. Make sure that you are not replacing your institution's office, say, by mailing letters.
8. Do you delegate not only assignments and rights, but also the responsibility associated with them? Only by transferring responsibility will you be sure that the work will be carried out.
9. Do you allow "reverse delegation"? If you have turned over assignments, rights and responsibilities, try not to go into a detailed discussion with the workers who can use your help during the course of the delegated activity.
10. Do you have direct sources of information? Information that goes through many stages, as a rule, is incomplete, imprecise or outdated. Check on the channels through which your information comes to you. If it is inevitable to have a large number of stages, it is best to ask for a written report from the first individual (from the primary source).
11. Are you able to say "no"? It is necessary to be prepared to give any subordinate an assignment and to transfer responsibility. But one cannot transfer too much either for then a lot of time will be taken off in explanations and coordination of actions. Saying "no promptly" to one extreme or another in the work will save time.
12. Do you meet the deadlines for the jobs that have been earmarked? If you are disciplined in this this will improve your own daily schedule. Precision is another means of saving time.
13. Are you prepared for unusual situations? Develop a "battle plan" ahead of time for those critical cases which one can foresee. It is not usually possible to make up for time lost because of wrong decisions. It is expected that a good manager will be capable of managing even under extreme circumstances.
14. Do you make notes for internal use briefly and only in unavoidable cases? Check all of your selection of items, chores, lists and entries intended for internal use. Are all of them necessary? Would it not be possible to transfer at least some of them to competent subordinates. And those which you must do yourselves, could they not be formulated more briefly and precisely?
15. Do you react to everything calmly and judiciously? Sudden impulsive reactions, as a rule, take a good deal of time. They cannot be equated with the rapidity of a reaction. Measures taken under the influence of impulse usually have to be changed. The proper self-control is also necessary in order to save time.
16. Do you allow telephone calls to interrupt your work and thus disturb your work rhythm? Establish which hour of the work day you have the fewest calls. Call this hour the "time without a telephone." List the questions which the secretary can answer independently.



17. Who draws up your daily schedule? Check to see to what extent this is the monopoly of your secretary. It would be good if she did not take care of this all by herself.

18. Do your colleagues drop into your office at any time? Constantly open doors motivate your coworkers to come to see you when there is no special need. Establish "visiting hours" and see how rapidly your tasks will be done.

19. Do you receive uninvited guests each day? Clear instructions are needed here. It is necessary to receive uninvited guests only regarding important problems and as an exception. But all exceptions should only prove the established rule.

20. Do you spend a great deal of time in conferences? Is this really effective? Do not forget that too much distraction by conferences leads to considerable losses of time.

21. Are you successful in giving clear instructions? Express your ideas as briefly as possible and give only precise information and instructions.

22. Do you work in many areas at the same time and do you start several jobs at once? Remember an important principle: before starting something new you should finish what you have started.

23. Does your desk remind you of a battlefield? Put it in order, and important and necessary tables and summaries should always be at hand. Look to see what can be removed from the desk. Means of depiction (colored stripes, paper clips and so forth) help to find the required document more quickly.

24. Do you frequently put off important business? If you become accustomed to keeping a regular list of priorities (see Point 2) you will have fewer postponements. Especially single out those jobs which must be done immediately.

25. Do you not speak too slowly? Ask people with whom you have close personal relations about this. Slow and monotonous speech puts people to sleep and reduces their attention span. You need more time in order to bring the person with whom you were talking up to date. It has been proved that in certain cases energetic speech is preferable. But check to be sure that this does not turn into tongue twisters.

26. Are you pedantic? Excessive scrupulousness causes irritation. Achieving the ideal state of affairs requires so much effort and time that it can hardly be recouped. It is necessary to have a reasonable measure, a middle ground. To go too far here is tantamount to not completing the work or doing it quarterly.

27. How patient are you? Haste and nervousness also increase losses of time. If you are constantly feeling impatient set yourself the goal of learning to loosen up. Autotraining and sometimes simply a desire to stop hurrying bring good results.

28. Do you read a lot? By mastering the method of speed reading you will more than double your possibilities of obtaining information. But at the same time try to weed out the sources of information that are less important for you and concentrate on the important ones.

29. Do you feel that you are a specialist in all matters? Do not try to be one. Consult with professionals and concentrate your efforts on management tasks: your coworkers will like this and you will have more free time.

30. What is your attitude toward your work: only a positive attitude toward one's work helps one to succeed everywhere. A person who works with involvement is one who works more rapidly. This is a universal means of solving all problems related to a shortage of time!

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#### BOOKS ON FOREIGN TRADE SURVEYED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 173-186

[Article by V. V. Krupchatnikova, candidate of economic sciences, Institute of Economics and Organization of Industrial Production of the Siberian Branch of the USSR Academy of Sciences (Novosibirsk): "With Whom and In What We Trade"]

[Text] During the past decade there has been rapid development of economic and scientific-technical cooperation between the USSR and foreign countries. As before, foreign trade plays a leading role in this.

The results of the country's foreign trade activity are reported completely enough in the statistical annuals "Foreign Trade of the USSR" (the last collection--for 1983). By analyzing all of these data one can present an integrated picture of the foreign trade ties of our state and those changes which have taken place in the structure of foreign trade and its geography during the past 10-20 years.

In 1984 the USSR traded with 145 countries (1970--106, 1960--79 countries). The leading place in the foreign trade of the Soviet Union (see Fig. 1) is held by the socialist states. The main trade partners here are the GDR, Czechoslovakia, Bulgaria and Poland. Their shares of the USSR foreign trade turnover in 1984 amounted to, respectively: 10.6, 9.0, 8.4 and 8.2 percent.

The Soviet Union trades with 103 developing countries. The leading partners among them are India (its share of the USSR foreign trade turnover is 2.0 percent), Libya (0.9 percent), Argentina (0.8 percent), Iraq (0.7 percent), Afghanistan (0.6 percent) and Egypt (0.5 percent).

In the 1970's, as a result of detente in international relations there was a considerable expansion of foreign economic ties between the USSR and industrially developed capitalist countries. In spite of the fact that in recent years reactionary circles of the West have been trying to impede this process, reciprocal commodity turnover continues to develop. The rates of its growth are highest in trade with West European countries. The FRG accounts for 5.4 percent of the USSR commodity turnover, Finland--3.4 percent, Italy--3.2 percent and France--3.0 percent. The proportion of the United States is 2.2 percent and Japan--2.1 percent.

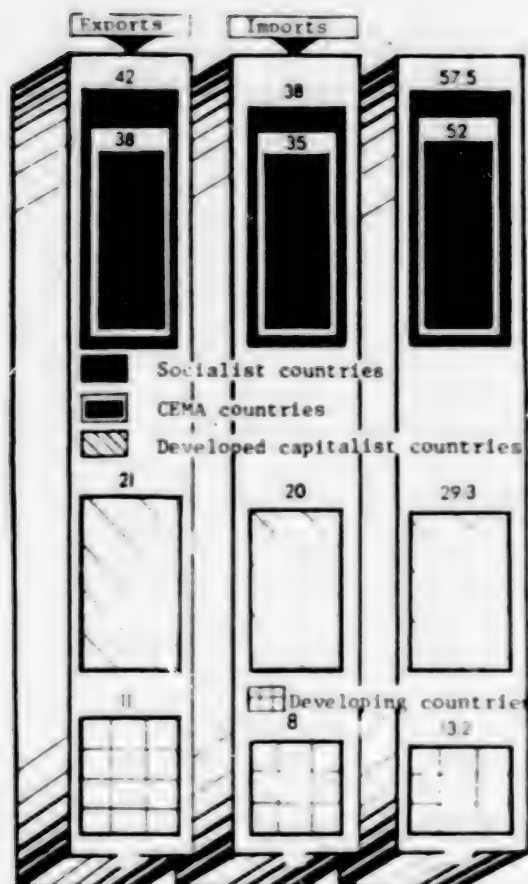


Fig. 1. Volume of USSR foreign trade with groups of countries in 1984, billions of rubles (AB); proportion of individual groups of countries in USSR commodity turnover, % (C).

In 1984 the USSR foreign trade turnover increased by 9.6 percent as compared to 1983 and amounted to 139.7 billion rubles. Here the share of the socialist countries in the USSR commodity turnover reached 57.5 percent as against 56.0 percent in 1983. The growth of the proportion of this group of countries took place as a result of the continuing decline in the share of industrially developed capitalist countries (29.3 percent in 1984 as against 30.0 percent in 1983, and also a certain reduction of the share of the developing countries (13.2 percent in 1984 and 13.9 percent in 1983).

Let us now take a look at the foreign trade structure (see Fig. 2). Exported goods (74.4 billion rubles in 1984) are the main source of currency revenues and therefore a great deal of attention is devoted to improving their structure. During the past 20 years serious changes have taken place in it (see Fig. 3) which reflect positive changes in the national economy as a whole and the dynamics of prices on the world markets. From 1960 through 1984 the



share of fuel and electric energy increased most appreciably and the proportion of food products and raw materials for their production decreased. These changes led to a situation where in modern Soviet exports there are two important areas: exports of fuel and electric energy (54 percent of all exports from the USSR) and exports of machines, equipment and means of transportation (13 percent). Let us discuss them in more detail.

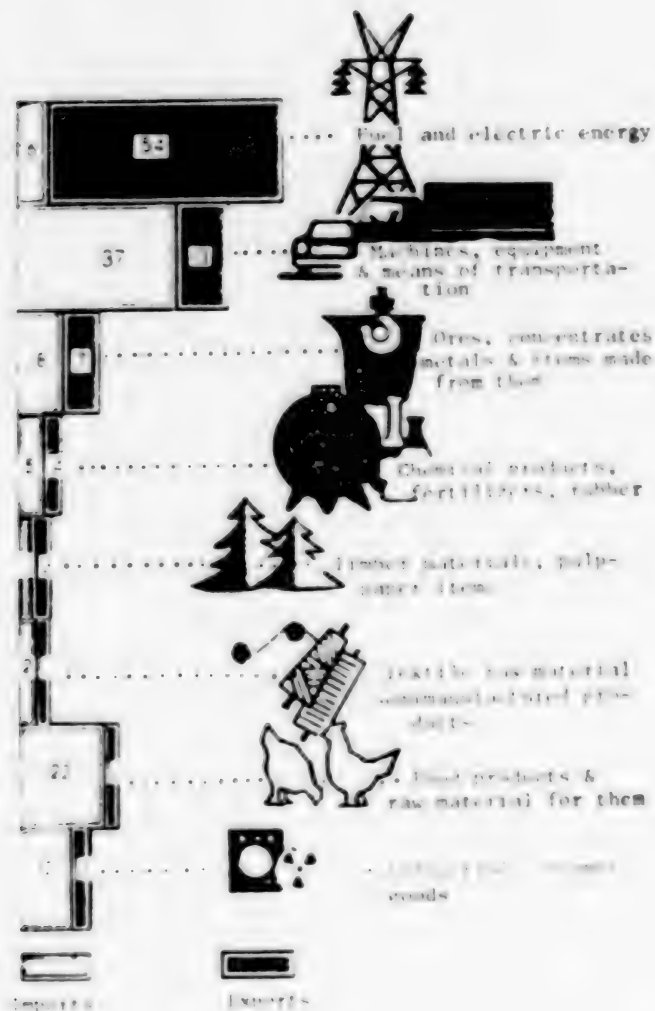


Fig. 2. The structure of Soviet exports and imports in 1984, %

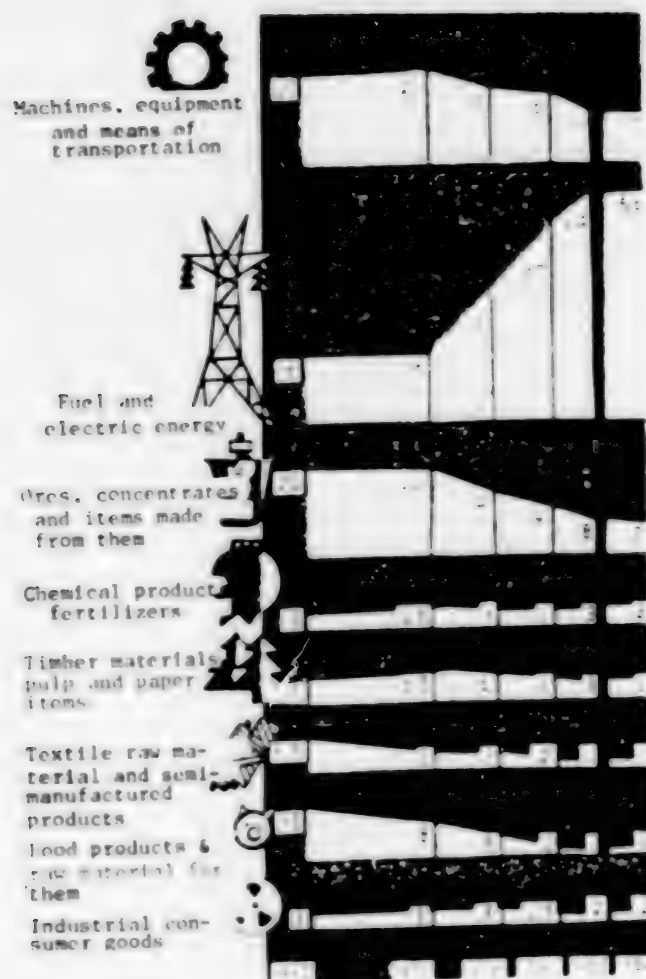


Fig. 3. The structure of USSR exports in prices of the corresponding years, %

The increase in the share of energy bearers that has taken place during the past 2 decades is related to the fact that during this period new deposits of petroleum and gas have been assimilated more intensively in the eastern part of the country and the great demand for them on the world markets and, consequently, the higher prices have made it advantageous to increase the

exports of these goods. As a result of the currency revenues from fuel and raw material exports the Soviet Union has had the opportunity to expand considerably its imports of goods. Most of the fuel and energy resources are delivered to the socialist countries, but in the middle of the 1970's there was a considerable increase in their deliveries to the industrially developed capitalist countries as well.

The sharp increase in the exports of petroleum and gas have reflected the changes in price setting on world markets. The increase in world prices exerted an influence first of all on the indicators of trade with capitalist countries: it is carried out with them according to current prices of the world market, and fuel provides for up to two-thirds of the currency revenues from these countries. Since 1975 the CEMA countries have changed over to a new policy of price setting in mutual trade whereby the level of new prices on the whole is lower than the level of prices on the capitalist market. The beneficial prices for Soviet petroleum have made it possible for the CEMA countries to avoid the sharp leaps in world prices for energy bearers. As a result they have annually saved about \$3 billion as a result of the difference between the world and the contract prices. But since 1982 the world prices for petroleum and gas had been dropping, which makes it less advantageous to further increase their deliveries to the foreign market.

In 1983 a total of 28.2 billion rubles' worth of petroleum and petroleum products were exported and 6.3 billion rubles' worth of gas. Fig. 4 shows the main buyers of Soviet petroleum and gas. This year 1.3 billion rubles' worth of solid fuel were imported, mainly to the socialist countries: to Bulgaria--347 million rubles, the GDR--216 million and Czechoslovakia--139 million rubles. Of the capitalist countries only Japan (76 million rubles) and Finland (78 million rubles) are more or less large purchasers. In 1983 2,797,000,000 rubles' worth of ferrous metals were exported abroad. Almost 60 percent of this sum is from rolled metals and it is exported primarily to the socialist countries.

A total of 1,916,000,000 rubles' worth of timber materials and pulp and paper items were exported. Round timber accounted for 499 million rubles, timber materials--694 million, paper--217 million and cardboard--90 million rubles. The largest purchasers of round timber were Japan (6.5 million cubic meters or 43 percent of the Soviet exports of this commodity) and Finland (3.9 million cubic meters or 20 percent). In 1983 we exported furs and hides (78.6 million rubles' worth) mainly to the capitalist countries: Great Britain--47.8 million rubles, the FRG--6.5 million, the United States--5.4 million and Switzerland--3.8 million rubles' worth.

As we know, a reliable path to increasing the effectiveness of foreign trade is to increase in the exports the share of goods with deep industrial processing, primarily machine-building products. From 1960 through 1983 the exports of machines, equipment and means of transportation in current prices increased approximately eightfold. These goods are delivered to almost 100 countries of the world and include more than 4,500 kinds. The reduction of their proportion in Soviet exports (from 22 percent in 1970 to 13 percent in 1983) was linked to a great degree to the increased proportion of petroleum and gas in it as a result of the higher prices for these exported goods.

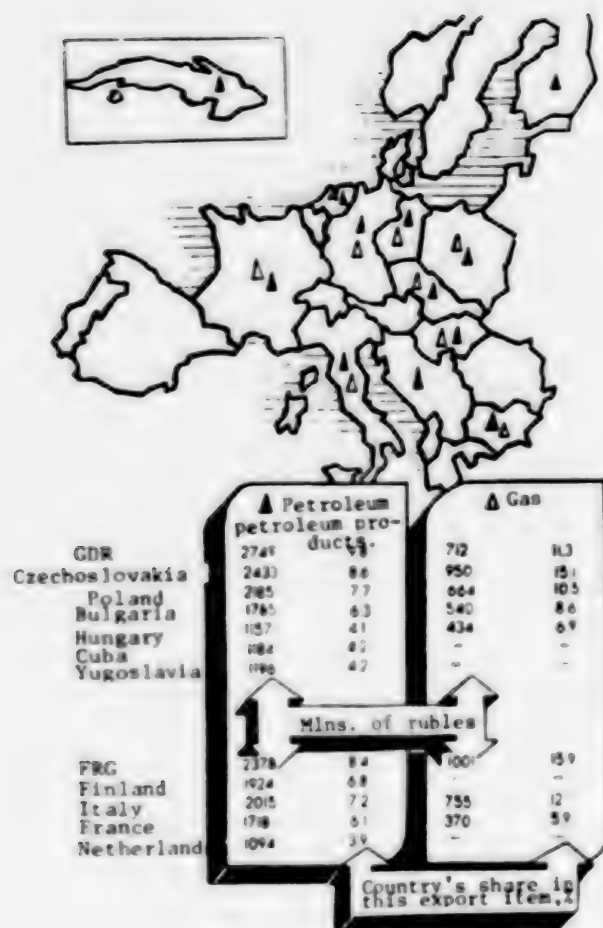


Fig. 4. Geographical distribution of Soviet exports of petroleum, petroleum products and gas in 1983.

The largest suppliers of technical equipment for the foreign market are energy machine building and the electrical equipment, automotive and aviation industries. Soviet machines and equipment are purchased mainly by the socialist countries (more than 70 percent of the exports of these products). Approximately 20 percent of all Soviet exports of technical equipment go to the developing countries. In the 1970's the exports of these goods to capitalist countries expanded somewhat, but their share in the overall exports of machine-building products does not exceed 4 percent.



In 1983 a total of 8,454,000,000 rubles' worth of machines, equipment and means of transportation were exported. These included the following large items:

energy equipment--1,118,000,000 rubles (delivered to Bulgaria, Hungary, the GDR, Mongolia, Cuba, Iran and others);

means of air communications--678,000,000 rubles (Libya, Cuba, Angola, Afghanistan, Iraq and others);

tractors and accessories, spare parts, batching items for tractors and garage equipment for them, including motors--490 million rubles (Poland, Cuba, the GDR, Hungary, Bulgaria and others);

trucks--415 million rubles (Angola, Bulgaria, Cuba, Hungary and Vietnam);

equipment for underground and open mining of minerals--278,000,000 rubles (Mongolia, Vietnam, Iran, Bulgaria and others);

machines, equipment and insulation for drilling and working wells and geological prospecting--260 million rubles (Vietnam, Cuba, Bulgaria, Mongolia, Afghanistan and others);

metal-cutting machine tools and forge and press equipment--227 million rubles (Romania, Bulgaria, the GDR, Poland, Czechoslovakia and others).

In 1983 238,000 passenger vehicles were exported and of these 29,500 went to Hungary, 28,800--to France, 20,800--to Great Britain, 17,600--to Bulgaria, 16,000--to Yugoslavia, and so forth.

In 1984 the exports of machine-building products increased by 9.6 percent, including means of transportation--by 17 percent.

In order to develop individual branches of the national economy, to accelerate scientific and technical progress and to raise the standard of living of the Soviet people it is important for our country to participate in international division of labor and, consequently, to have the possibility of acquiring technically advanced equipment, licenses and consumer goods from other countries. During 1984 Soviet imports increased by 9.6 percent and amounted to 65.3 billion rubles.

The structure of Soviet imports presented in Fig. 5 shows the significant proportion of machines and equipment (about 38 percent) and also food products and industrial consumer goods (more than 30 percent).

From 1960 through 1984 certain positive changes took place in the structure of imports (see Table 2), to be sure, not so significant as in the structure of exports. The main change was the increase in the proportion of agricultural goods.

In 1983 the USSR imported 22.7 billion rubles' worth of machines, equipment and means of transportation. A great deal of attention is being devoted to purchases of modern batching equipment which make it possible to put objects under construction into operation at accelerated rates. In 1983 alone 2.5 billion rubles' worth were acquired for the food, textile, chemical and printing industries which amounted to 11 percent of the imports of machines. The proportion of ships and ship equipment was also significant--8.8 percent of all the imports of technical equipment (2 billion rubles), trucks and garage equipment--7.5 percent (1.7 billion rubles), metal-cutting machine tools and forge and press equipment--5.7 percent (1.3 billion rubles), lifting and transport equipment--5.3 percent (1.2 billion rubles) and energy and electrical equipment--5.7 percent (1.3 billion rubles).

About 70 percent of the imports of machines and equipment are from socialist countries. From the GDR the Soviet Union purchases forge and press equipment, ships, railroad rolling stock, and agricultural machines; from Czechoslovakia--machine tools and equipment for the chemical and textile industry; from Poland and Bulgaria--ships, agricultural equipment, and electrical equipment; from Hungary--buses, and so forth.

Purchases of machines and equipment from capitalist countries have also increased. They amounted to 5.8 billion rubles in 1984 or 24.3 percent of the imports of machines and equipment as a whole. For individual items of imports of technical equipment the capitalist countries are the main suppliers. Thus 98 percent of the equipment for automotive plants is purchased from the FRG, Japan, Italy and France. Japan delivers to the Soviet Union a considerable part of the imports of road construction machines, the FRG and France--more than 40 percent of all the rolling equipment, and Great Britain, Italy, the FRG, Finland and Japan--more than 60 percent of the machines, equipment and installations for drilling, operating wells, geological prospecting and so forth. As a result of the policy of restrictions and economic sanctions (temporary halting of the issuance of export licenses for computers and other of the latest technical equipment and technology, petroleum and gas equipment; the refusal to renew Soviet-American agreements for exchange in the area of energy, science and technology) the United States of America have reduced their participation in the delivery of machines and equipment to the USSR to 0.6 percent of the overall amount of Soviet imports of technical equipment.

In recent years the imports of foodstuffs have increased. Their proportion in the overall imports of the USSR almost doubled the analogous indicator for industrial consumer goods. In 1983 we purchased food products from other countries which are traditional items of imports since they are not produced in the USSR because of natural and climatic conditions (coffee, cocoa, spices, certain kinds of fruits and so forth), and also products whose production in our country does not fully satisfy the demand of the population (see Fig. 6).

Foreign trade contributes to successful implementation of the food program not only with purchases of food products and raw material for their production. During the 8th-10th five-year plans 5.2 billion rubles' worth of various kinds of agricultural-technical equipment were delivered from above as well as 1.4 billion rubles' worth of fertilizers and chemical substances, 927 million rubles' worth of seeds and planting materials, and 217 million rubles' worth

of concentrated volume feeds. In 1984 the deliveries of agricultural equipment to the Soviet Union amounted to 1.2 billion rubles, and chemical means of plant protection--391 million rubles.

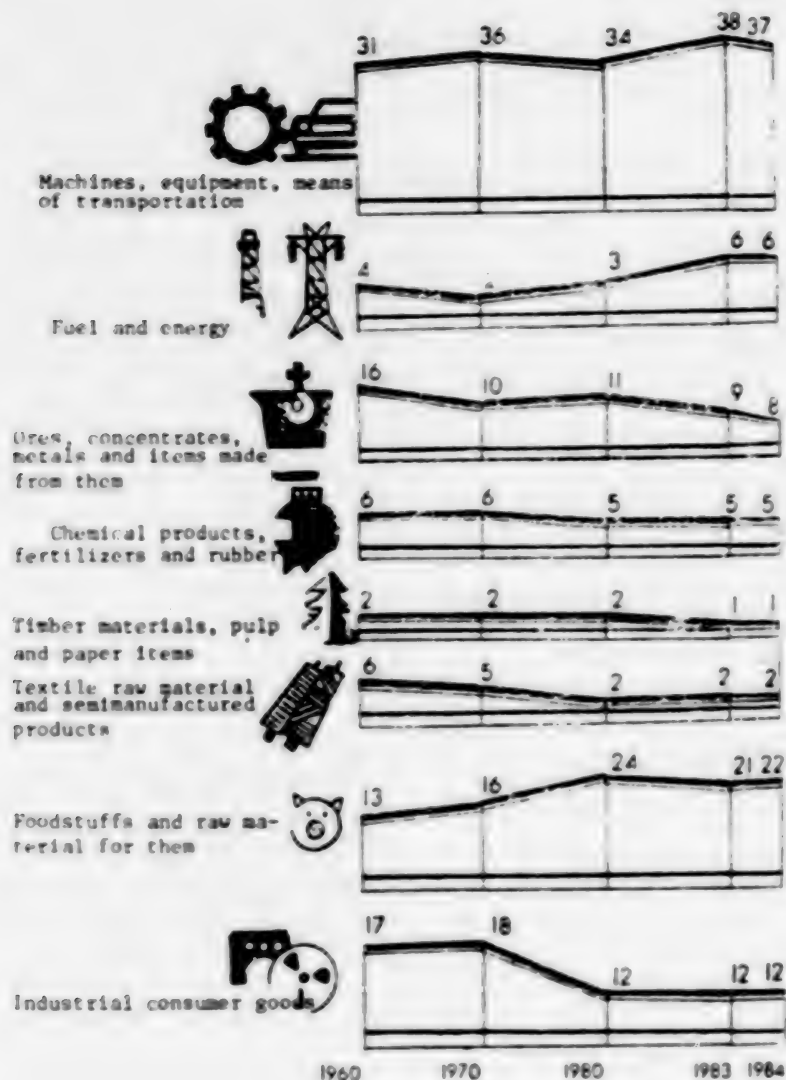


Fig. 5. The structure of USSR imports in prices of corresponding years, %.

Among the industrial consumer goods in 1983 the most significant purchases were of various kinds of fabrics (656 million rubles), leather footwear (1.047 billion rubles), outer clothing (1.136 billion rubles), knitwear (577 million rubles), furniture (580 million rubles) and goods for cultural and domestic purposes (504 million rubles).



Fig. 6. Import of food products and their geographical distribution in 1983.

An analysis of the dynamics of exports and imports in comparable prices helps to judge the changes in the physical volume of foreign trade. This makes it possible to eliminate the influence on the export and import structure of the irregular changes in world prices for individual groups of goods. Examples of this kind of research are the works by V. Seltsovskiy "Improvement of Analysis of Structural Changes in Foreign Trade" (VNESHNYAYA TORGOVLYA, No 3, 1981) and



"Certain Economic and Statistical Methods of Analyzing the Development of USSR Foreign Trade Under the 9th and 10th Five-Year Plans" (VNESHNYAYA TORGOVLYA, No 5, 1982). These articles illustrate the clearest differences in the dynamics of the proportions of individual groups of commodities in current and comparable prices (Fig. 7). Thus the proportion of exports of fuel and electric energy in current prices increased but in comparable prices they decreased, and the change was in the opposite direction for the proportion of machines and equipment. Thus the representation of the commodity structure of exports in comparable prices made it possible to reflect progressive strides that had been noted in the ratio between individual items of export (increased proportion of prepared products with a reduction of the proportion of raw material). In the commodity structure of imports in current and constant prices there are no great differences since the proportion of commodities whose prices changed sharply during this period is small.

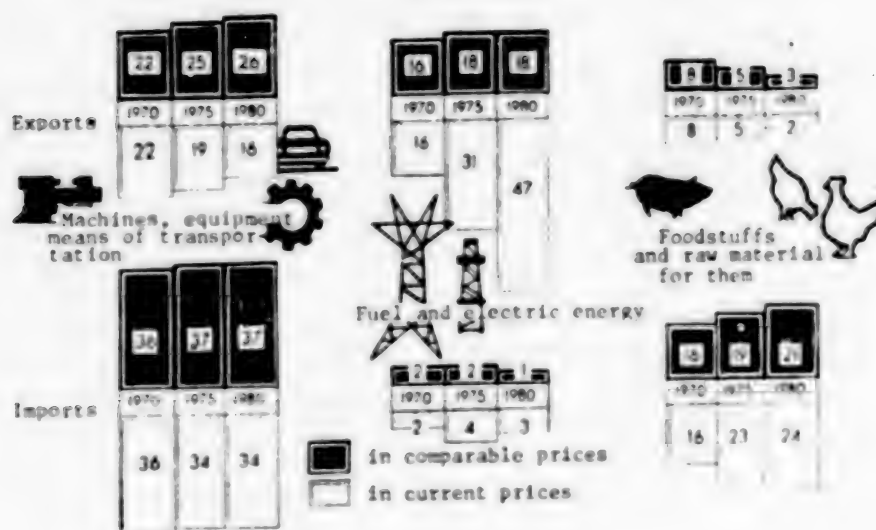


Fig. 7. Proportion of individual items in exports and imports in current and comparable prices, %.

Effective development of USSR foreign trade activity during the 9th-11th five-year plans is also reflected in the improvement of the indicator of "trade conditions" (the relationship between the price index for exports and the price index for imports). If export prices grow more rapidly than import prices in the country can use the profit from exports to obtain more imported goods (in physical volume). The indexes of the average prices for exports and imports and also the index of "trade conditions" are presented in the table.

Indexes of Average Prices of Exports and Imports and Their Ratio, 1970 = 100%

	<u>1976</u>	<u>1981</u>
Indexes of average prices for exports	164	301
Indexes of average prices for imports	154	213
Index of "trade condition"	106	141

Foreign economic activity and particularly foreign trade contribute to successfully solving national economic problems and create favorable conditions for the utilization of mutually advantageous business cooperation with all states as well as improvement of international relations.

FOOTNOTE

1. On the capitalist market the official sales price for the standard light Arabian oil established in 1981 at the level of \$34 per barrel (\$251 per ton) had dropped by 1983 to \$29 per barrel (\$214 per ton) and practically did not change in 1984. During 1982-1984 there was a drop in the average annual prices for natural gas under the influence of the lower prices of liquid fuel that was competing with it (diesel fuel, fuel oil, petroleum). The tendency toward further reduction continued in 1983-1984.

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## VARIOUS BUSINESS PRACTICES SATIRIZED

Novosibirsk EKONOMIKA I ORGANIZATSIYA PROMYSHLENNOGO PROIZVODSTVA (EKO) in Russian No 11, Nov 85 pp 187-190

[Article by Vladimir Pankov: "Miniatures"]

[Text] 1. Petitioners

"Comrade Director, here I have brought," said the chief of the planning division and brought into the office a pathetic person in ragged clothing and worn-down shoes.

The director looked at the person suspiciously: "What does he do, beg for a living? Is he a beggar?"

"He is begging--yes, but he is not a beggar...."

"Does he at least have documents?" the director asked squeamishly. "Help yourself," answered the beggar and immediately handed over a couple of certificates.

"What do you mean, have you worked in all of these organizations?" the director was untrustingly interested. "Or...did you just get the documents?"

"God forbid to steal! Sin No 1! All the documents are authentic!"

"But here you are quite different. You have a magnificent appearance. You are worn out, is that what we are to understand?"

"By no means. I had simply dressed up for the picture. Externally it was necessary to have polish."

"And now?"

"And now there is the adjustment of the plan. It is necessary to be able to beg...."

"This is a class petitioner," the chief of the planning division whispered to the director heatedly, "he beats his forehead on the floor and it shakes!"

The director was silent while making an evaluation. And he noted in his thoughts: "I should go to the first deputy minister."

"It's all right, we shall move on to the top," agreed the ragged one. "But not with tears!" the director warned severely.

"Well, what do you mean! Exclusively because of objective factors! In my arsenal there are about 400 relatively honest objective factors. And these are not random accidents, not weather conditions but mainly technically substantiated excuses that have been multiplied by sociodemographic circumstances. Everything is quite reliable."

"So, Comrade Director, let us register and shall we go?" asked the beggar hopefully.

"Let us fly!" the director said decisively. "Immediately! Before the end of the quarter--let's shake hands...."

## 2. A Stranger Among Strangers

"Do not try anything the first time," the boss instructed severely. "You must enter into their life and become one of them. Spare no money. At first celebrate, say, your birthday." He weighed a package of credentials in his hand. "Well, 5 days off will be enough. But just make sure that you do not get on too well. You are supposed to have a bad liver."

"And will I receive wages from them?"

"What do you mean? Like everyone else. Take your share, but within reason. Like everyone else. Well, there, there are smoke brakes, stores, anecdotes... You can buy a gift for somebody, but look, without too much interest. You are supposed to be married..." the boss cleared his throat. "So you will handle this matter like everything else."

"I understand."

"Do not try to make contact with us. You must get into the middle of things--that is the main thing. We will find you ourselves. At the necessary time. Someone will come from us and say that they are from Mikhail Mikhalych."

"From you, you mean?"

"From me. He will bring documents. With figures. Your task is to put them in the reports."

"I do not understand?!" the agent was tormented. "What is all this about paper if there is no secret?"

"About what? About our plant," the boss sighed. "The percentage of fulfillment of the plan, the quality of repair...."



"But what do you mean, Mikhail Mikhailich?" the agent said unexpectedly. "What percentage of ours, excuse me? What quality? Of what repair? This is complete misinformation!"

"Be quiet! Do you think that in the administration where we are sending you they do not like a good percentage? The boss waved his hands as if tired. "We are doing the same thing!..."

### 3. Money Without Interruption

A person with a big trunk comes in to the plant director's office, he opens it and silently puts a thick packet of money on the table. "What is this?" the director turns away from the paper as though crazed.

"Money," the visitor explains calmly and continues to set out packages.

"What does this mean?" the director falls into confusion. "What are you, a bribe taker?"

"There are too many bribes, do you not think so?" the guest remarks in a businesslike way, taking out some more money.

"Well what then?"

"We are fulfilling the plan."

"What plan?"

"The monthly plan. Now every month you will receive money from us. Not bad, eh?"

"Listen, who are you? Why are you playing with me?"

"What do you mean, do you not need money?"

"A strange question..."

"I have in mind your plant."

"Ah! The plant... What did you bring, the bonuses? Why are you being so secretive?"

"No, these are not the bonuses. These are our deliveries to you."

"Deliveries?" the director stared at the pile of various denominations. "For some reason I do not remember that any of our suppliers print money...."

"But we do not print it. We received it from our suppliers."

"How is that?"

"Well, our plan is in rubles! There are always interruptions in the energy supply, there is a terrible shortage of copper, but there are no interruptions in the supply of money. Why not settle our accounts with each other not in products, but in rubles?"

"Ah, ah!" the director spread out his arms. "And what will we do with it?"

"Give it to your consumers. What do you mean, do you not have to fulfill the plan?"

The director got up and began to put the money back into the visitor's trunk without saying anything.

"After all, you have a plan in rubles, too." The guest would not give up. "Well, if real money shocks you, we could simply transfer it."

"It would be even worse to transfer it," the director shot out sharply.

"Why?"

"Because, my dear, our plan is not only in rubles, but also in tons!"

The man with the trunk left the office and combed the hair on the back of his head. And suddenly it was as if he turned blue. He took out of his pocket a handful of coins and weighed them on his palm.

"Oh, in tons.... I should have brought coins!"

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